

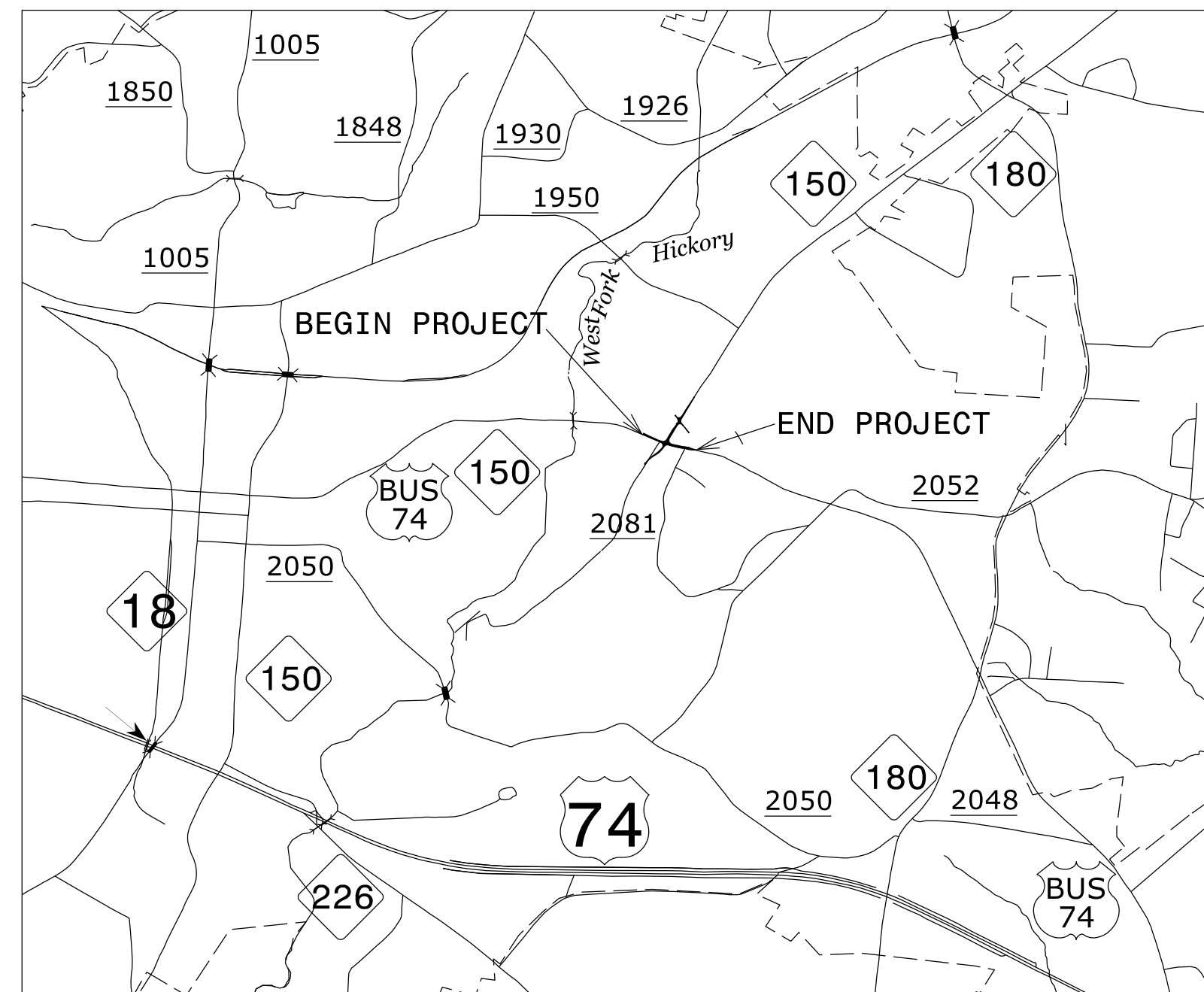
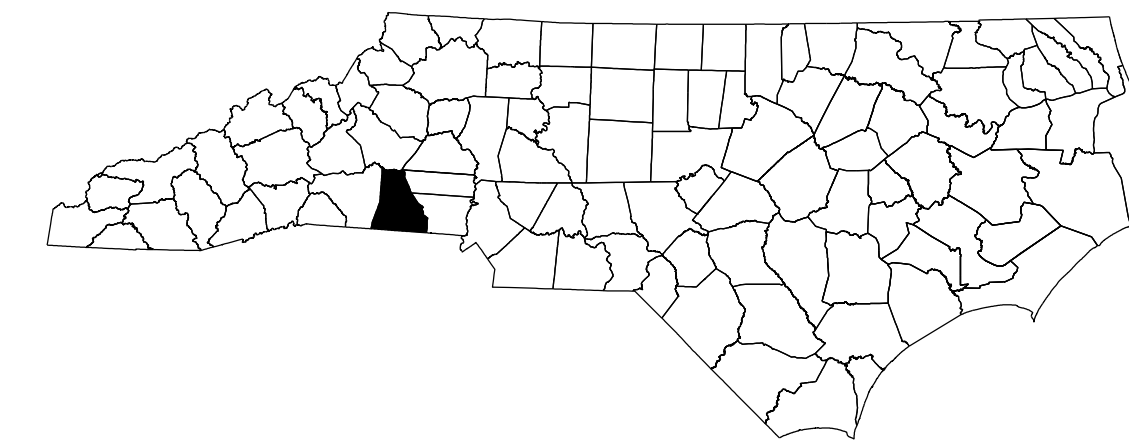
TIP PROJECT: U-5775

CONTRACT:

Project No.	Sheet No.
U-5775	Sig. 0.0

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

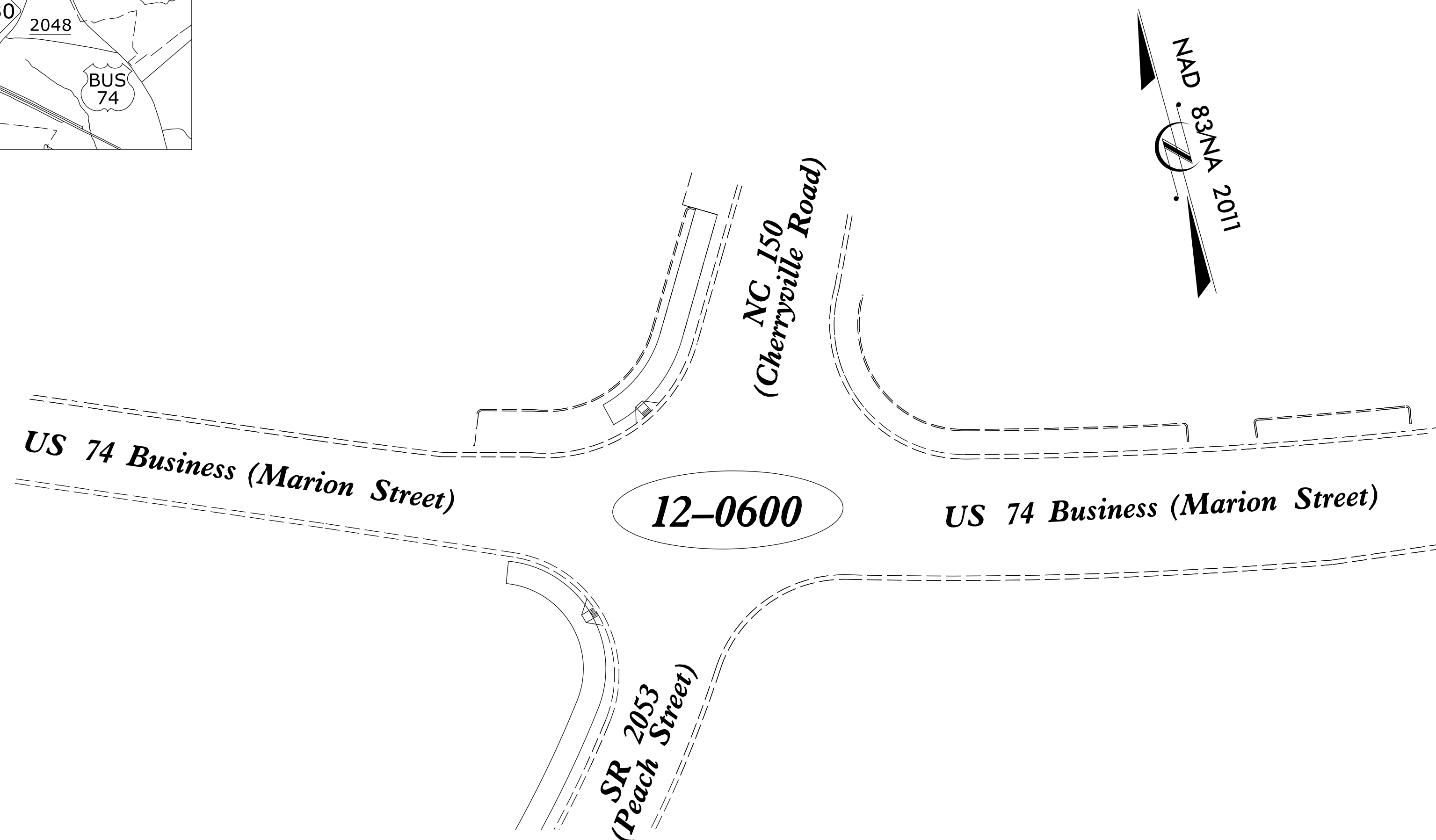
CLEVELAND COUNTY



VICINITY MAP

**LOCATION: INTERSECTION OF US 74 BUS (MARION STREET) AT
NC 150 (CHERRYVILLE ROAD) /SR 2053 (PEACH STREET)**

TYPE OF WORK: TRAFFIC SIGNALS



INDEX OF PLANS		
Sheet #	Reference #	Location /Description
Sig. 0.0	-----	Title Sheet
Sig. 0.1-0.2	-----	Revised Standard Drawings
Sig. 1.0-3.9	12-0600	US 74 Bus. (Marion Street) at NC 150 (Cherryville Road)/ SR 2053 (Peach Street)
MI-M8	-----	Standard Metal Pole Details

LEGEND


##-#### SIGNAL INVENTORY NUMBER

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

R. Nicholas Zinser, PE – Western Region Signals Engineer
Todd Joyce, PE – Signal Equipment Design Engineer
Gregory A. Green – Signal Communications Project Engineer
Heidi Berggren, EI– Signal Communications Project Design Engineer

Prepared for the North Carolina Department of Transportation
In the Office of:



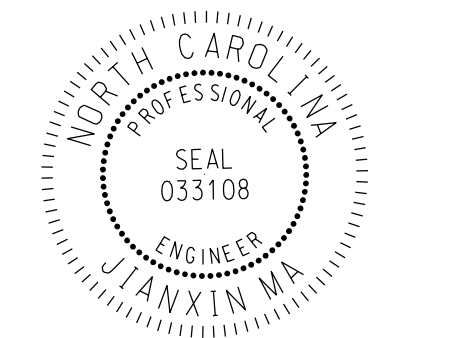
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
919.829.0328

Refer to Roadway Standard Drawings NCDOT” dated January 2018 and Standard Specifications for Roads and Structures” dated January 2018.

Jimmy Terry, PE
PROJECT ENGINEER

Jianxin(Justine) Ma, PE PTOE
PROJECT DESIGN ENGINEER

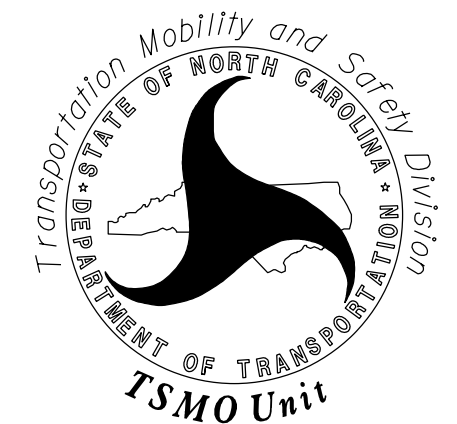
SEAL



DocuSigned by:
Jianxin Ma
827E1953081444F
SIGNATURE

3/1/2022
DATE

DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY
AND SAFETY DIVISION



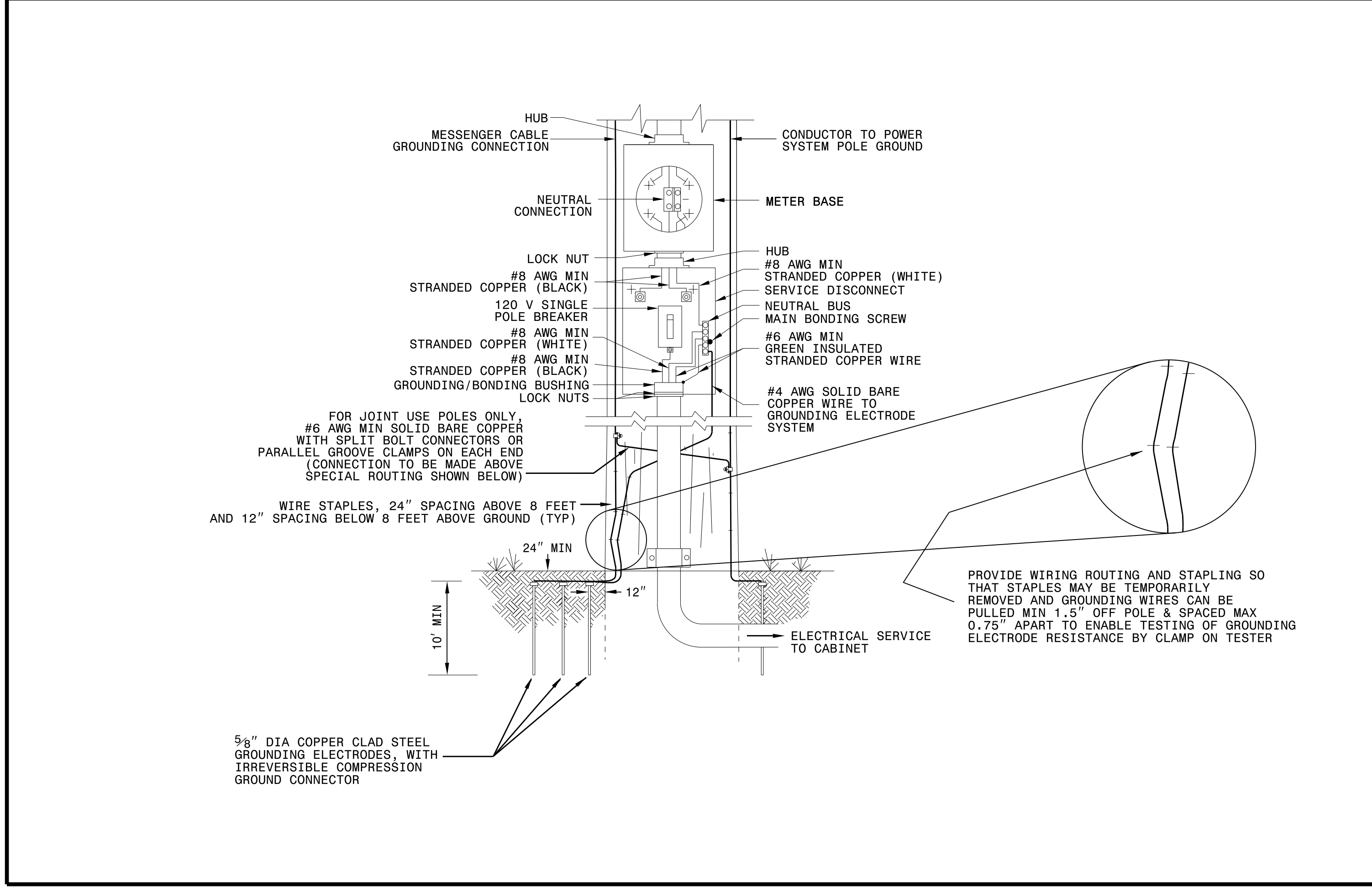
TSMO Unit

750 N. Greenfield Parkway, Garner, NC 27529

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
ELECTRICAL SERVICE GROUNDING
GROUNDING AND BONDING

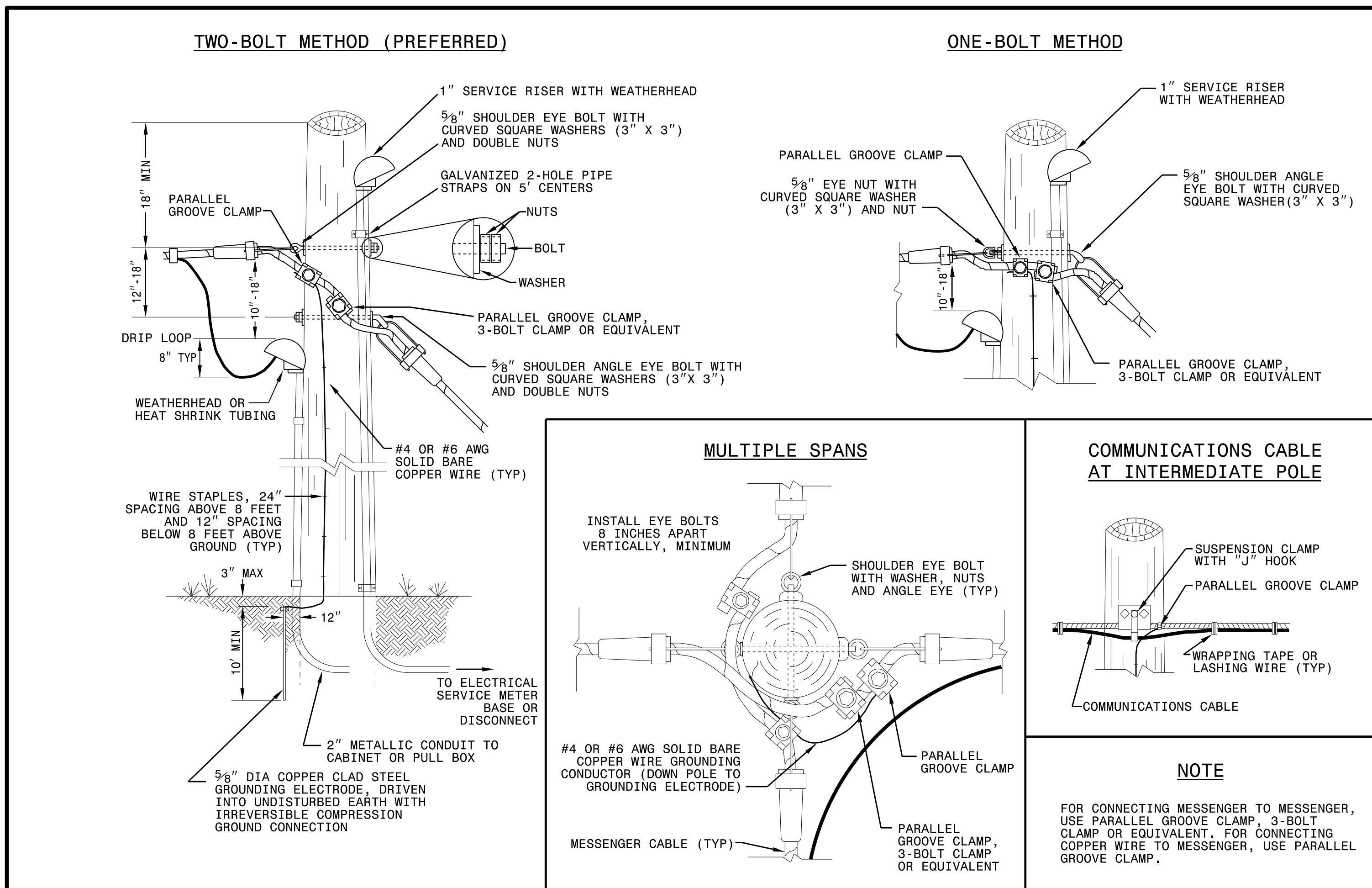
SHEET 1 OF 1
1700D01



1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
WOOD POLES
METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1
1720D01

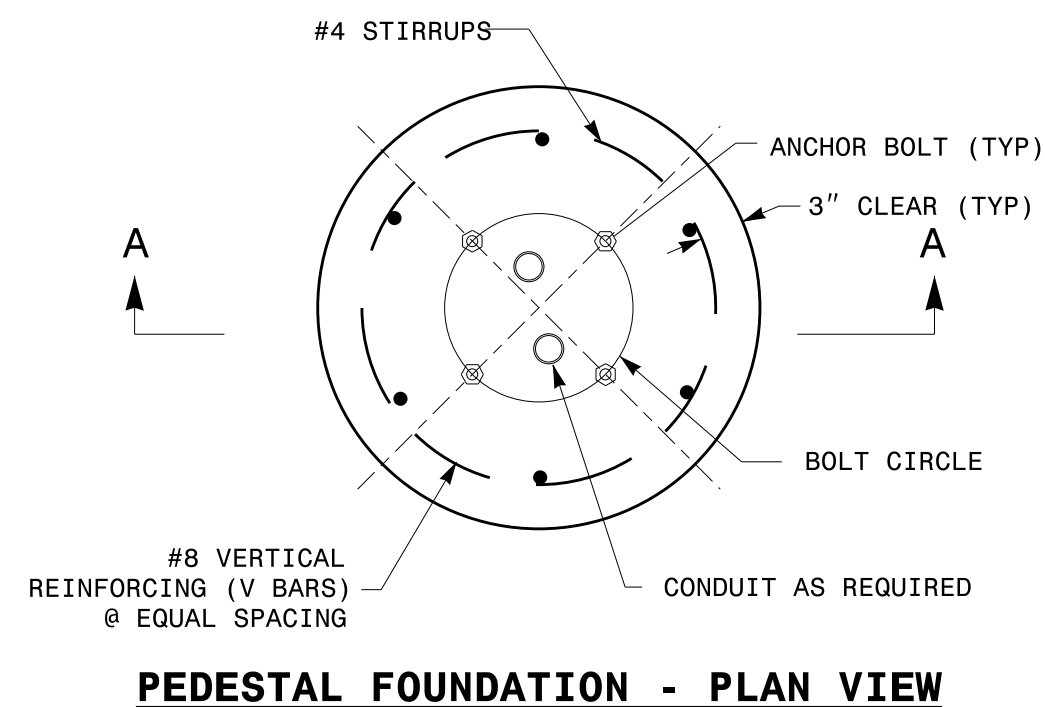


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FINAL UNLESS ALL
SIGNATURES COMPLETED

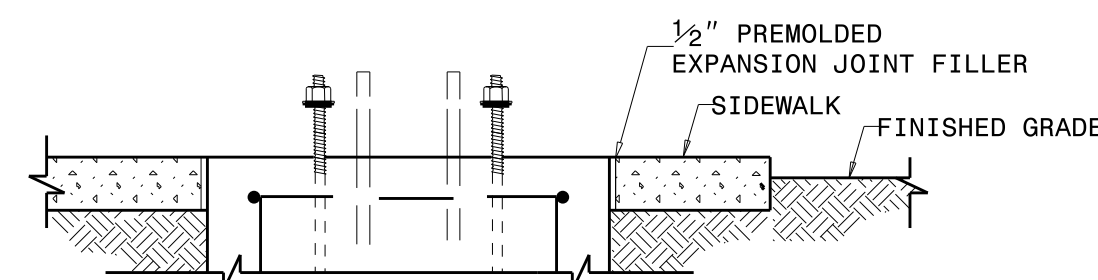
See Plate for Title

<p>Prepared in the Offices of:</p>	<p>SEAL</p>
<p>750 N. Greenfield Parkway Garner, NC 27529</p>	<p>DocuSigned by: <i>Mohd Aslami</i> 10/11/2017 DATE</p>

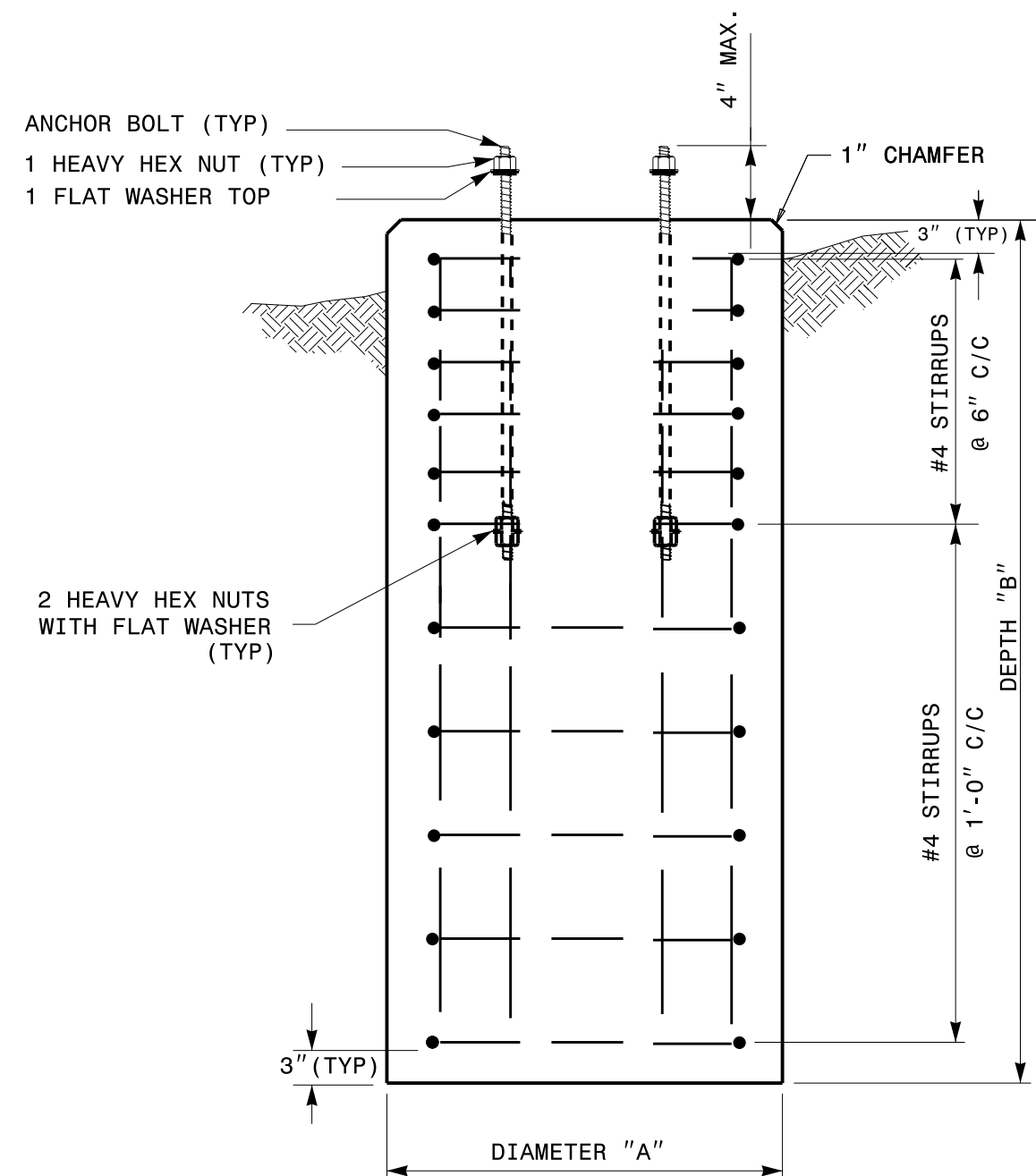
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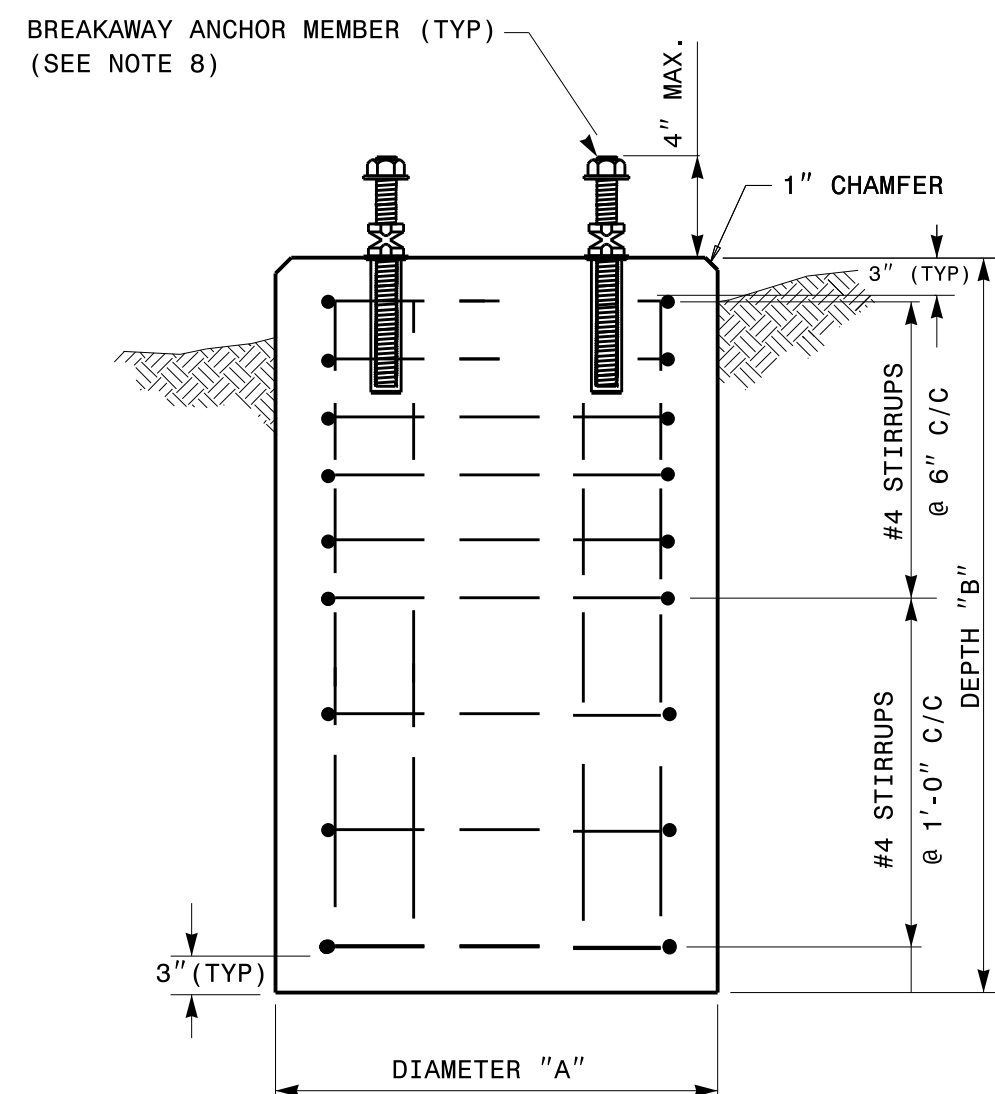
PEDESTAL FOUNDATION - PLAN VIEW



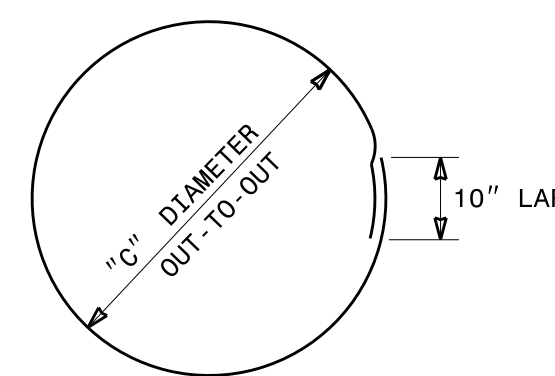
PEDESTAL FOUNDATION DETAILS FOR SIDEWALK



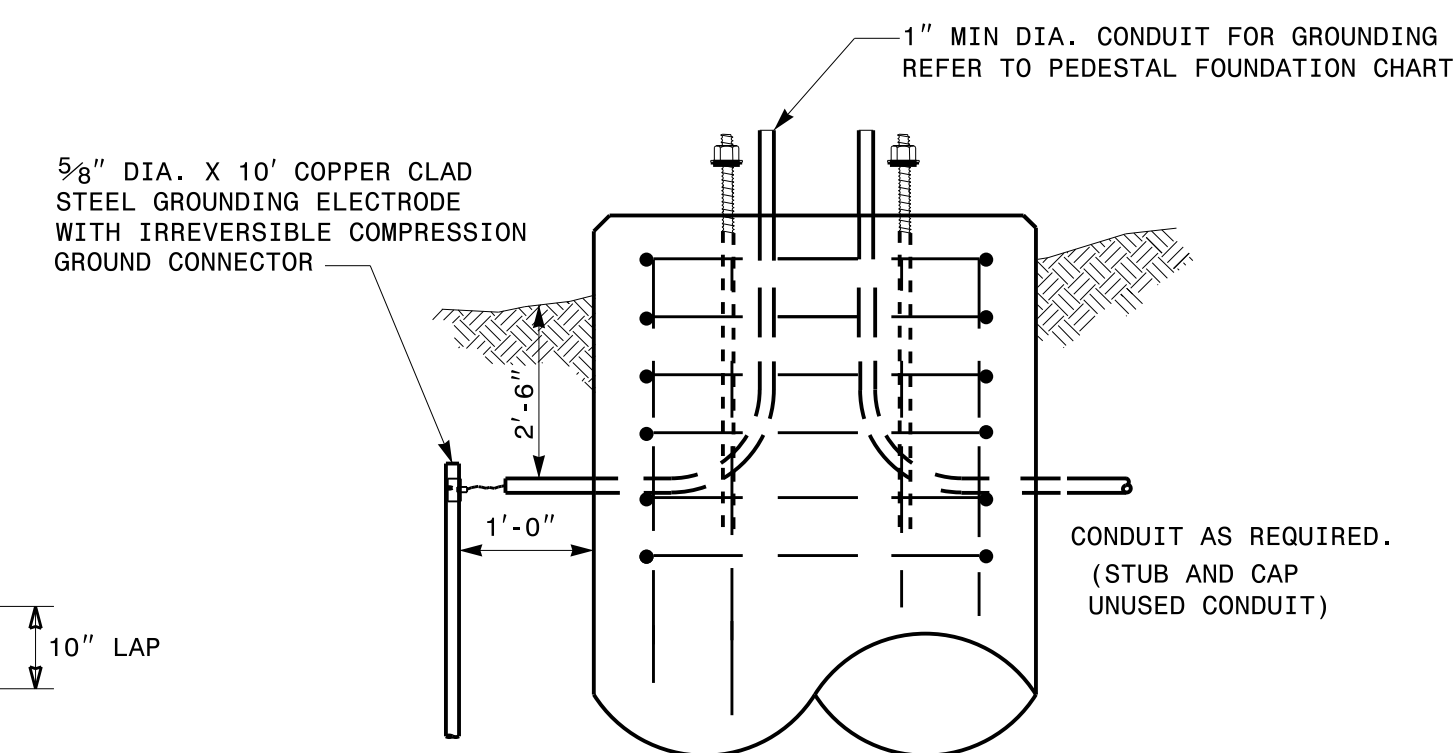
TYPES I, II & III
SECTION A-A



TYPES I & II ONLY
SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

NOTES:

- CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
- COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
- USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF $F'c = 3000$ PSI (MIN.).
- USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
- GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
 - SANDY TYPE SOIL
 - NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
 - WIND SPEED NOT TO EXCEED 140 MPH
 IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
- MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
- ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
- USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4 1/2" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6 5/8". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.

PEDESTAL FOUNDATION TYPE AND SIZE							
TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	1/2	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	3/4	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

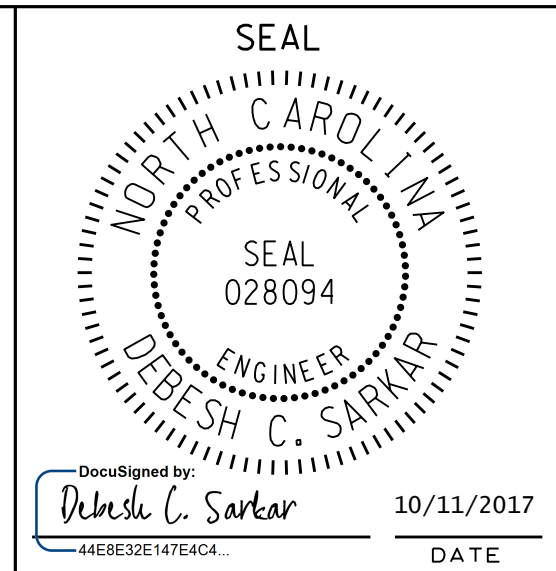
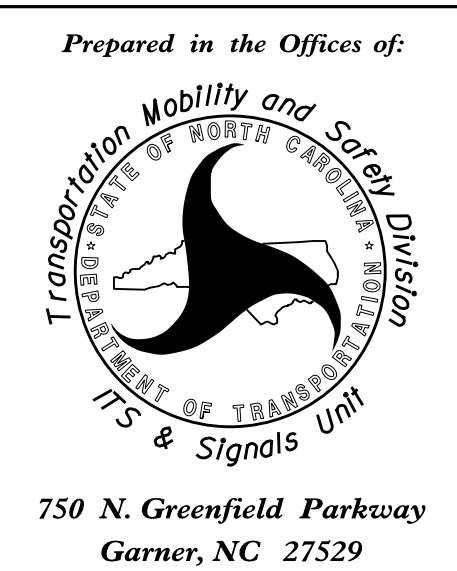
REINFORCING STEEL SCHEDULE													
TYPE	V-BAR				STIRRUP								
	SIZE #	QTY	LENGTH	WEIGHT LBS	SIZE #	QUANTITY			LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	TOTAL STEEL WEIGHT LBS
						VERTICAL ON 6" CENTERS	ON 12" CENTERS	TOTAL					
I	8	6	3'-0"	56	4	0	4	4	5'-7"	1'-6"	0'-10"	15	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	53	175

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
PEDESTALS
FOUNDATIONS

SHEET 1 OF 1
1743D01

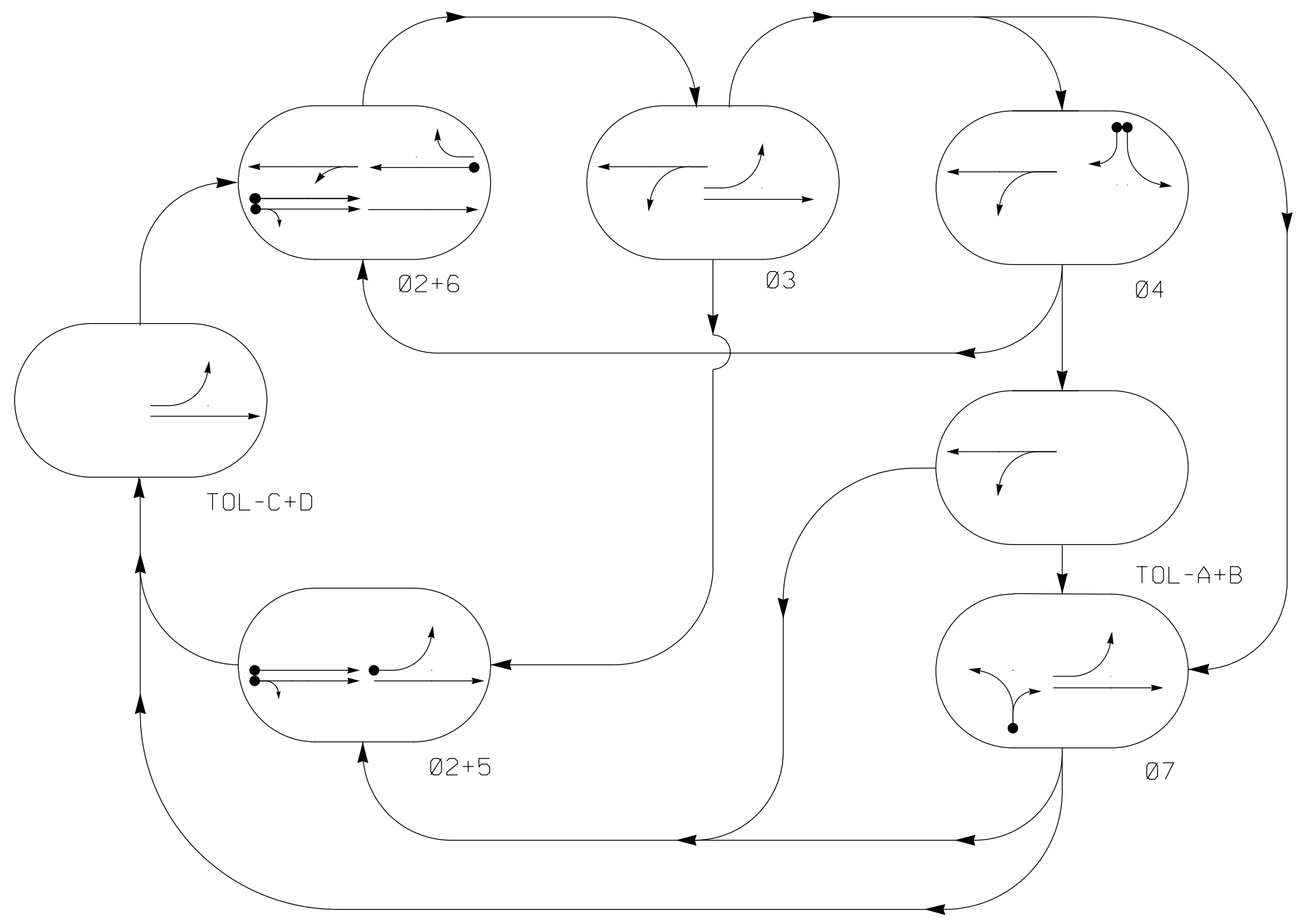
See Plate for Title



DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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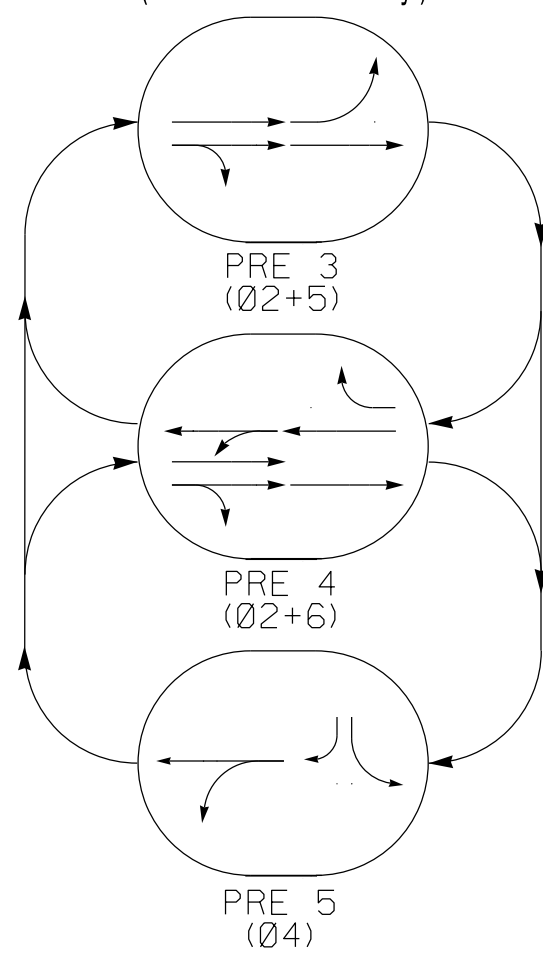
PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ⇄ PEDESTRIAN MOVEMENT

EV PREEMPT PHASES (Medium Priority)



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY			
2A	6x6	70	*	*	2	Y	Y	-	-	-	*
2B	6x6	70	*	*	2	Y	Y	-	-	-	*
4A	6x40	0	*	*	4	Y	Y	-	-	3	*
4B	6x40	0	*	*	4	Y	Y	-	-	-	*
5A	6x40	0	2-4-2	Y	5	Y	Y	-	-	3	Y
6A	6x6	70	*	*	6	Y	Y	-	-	-	*
7A	6x40	0	2-4-2	Y	7	Y	Y	-	-	3	Y

* Video Detection Zone

SIGNAL FACE I.D.

All Heads L.E.D.

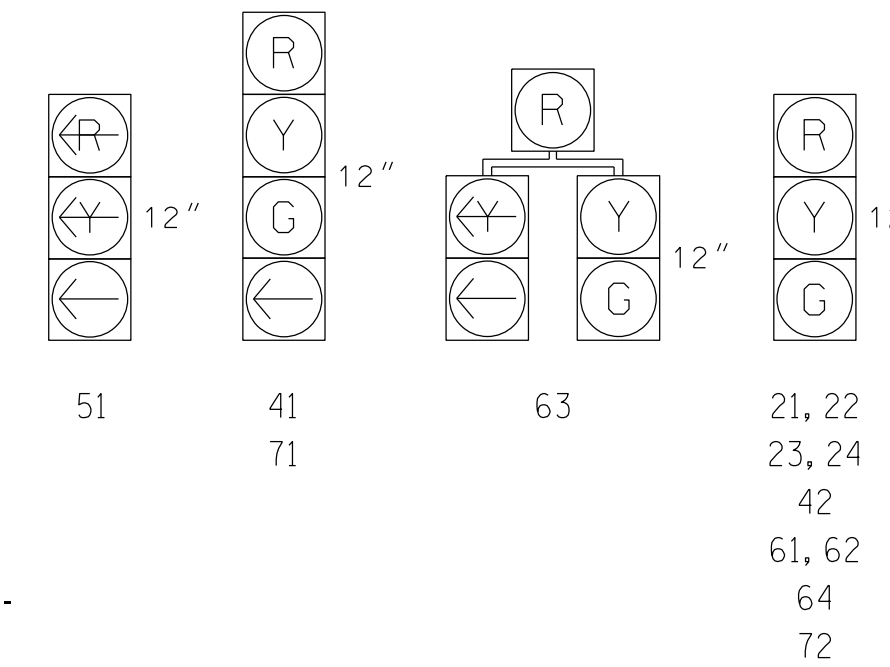


TABLE OF OPERATION

SIGNAL FACE	PHASE													
	Ø2+5	Ø2+6	Ø3	Ø4	Ø7	TOL-A	TOL-B	TOL-C	TOL-D	PREF 3	PREF 4	PREF 5	PREF 6	PREF 7
21, 22	G	G	R	R	R	R	R	G	G	R	Y			
23, 24	G	G	G	R	G	R	G	G	G	R	Y			
41	R	R	R	G	R	R	R	R	R	G	R			
42	R	R	R	G	R	R	R	R	R	G	R			
51	←	←	←	←	←	←	←	←	←	←	←			
61, 62	R	G	R	R	R	R	R	R	G	R	Y			
63	R	G	G	G	R	G	R	R	G	G	Y			
64	R	G	G	G	R	G	R	R	G	G	Y			
71	R	R	R	R	G	R	R	R	R	R	R			
72	R	R	R	R	G	R	R	R	R	R	R			

OASIS 2070 TIMING CHART

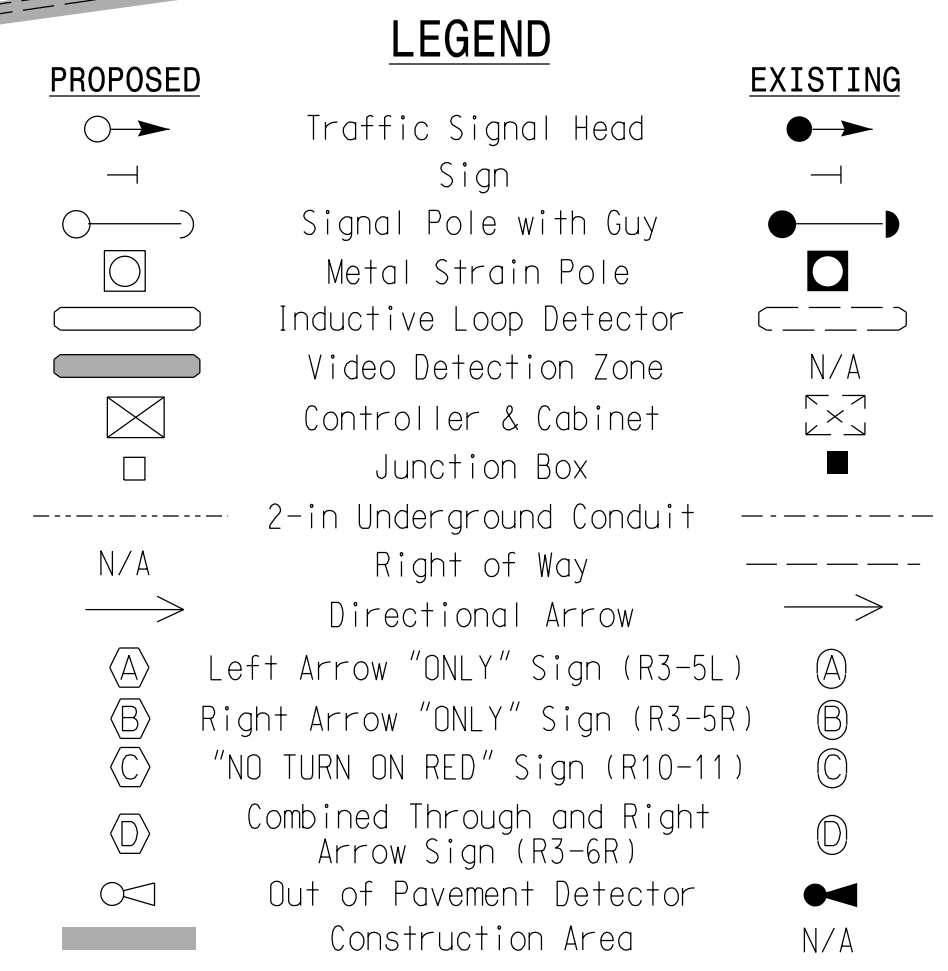
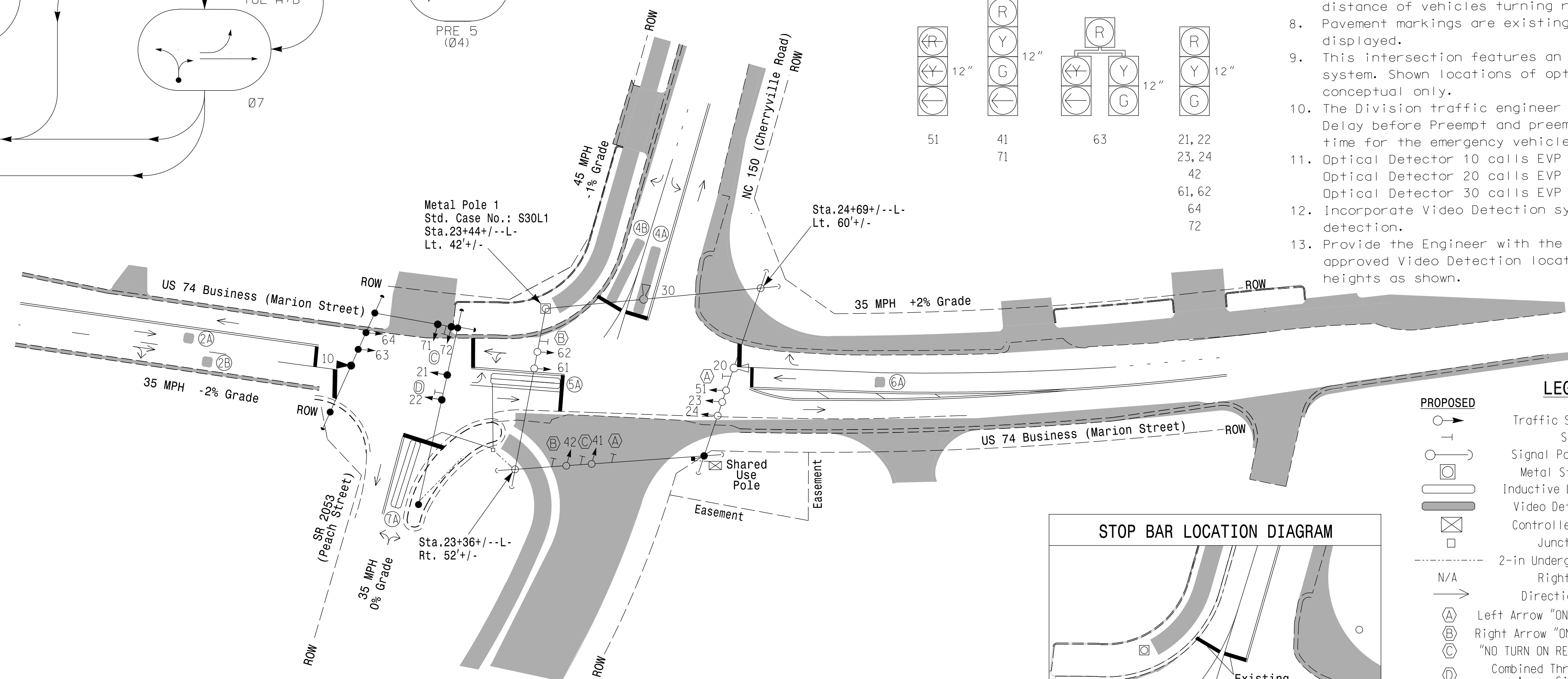
FEATURE	PHASE									
	2	3	4	5	6	7	TOL-A	TOL-B	TOL-C	TOL-D
Min Green 1*	10	4	7	4	10	7	4	4	4	4
Extension 1*	3.0		2.0	2.0	3.0	2.0				
Max Green 1*	45		20	20	45	20				
Yellow Clearance	4.0	4.0	3.0	3.0	4.0	3.0	3.7	3.0	4.0	3.0
Red Clearance	2.1	1.9	2.1	1.9	2.1	2.3	1.2	1.9	1.3	1.9
Red Revert	2.0		2.0	2.0	2.0	2.0				
Walk 1*	-		-	-	-	-				
Don't Walk 1	-		-	-	-	-				
Seconds Per Actuation*	-		-	-	-	-				
Max Variable Initial*	-		-	-	-	-				
Time Before Reduction*	-		-	-	-	-				
Time To Reduce*	-		-	-	-	-				
Minimum Gap	-		-	-	-	-				
Recall Mode	MIN RECALL		-	-	MIN RECALL	-				
Vehicle Call Memory	YELLOW		-	-	YELLOW	-				
Dual Entry	-		-	-	-	-				
Simultaneous Gap	ON		ON	ON	ON	ON				

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

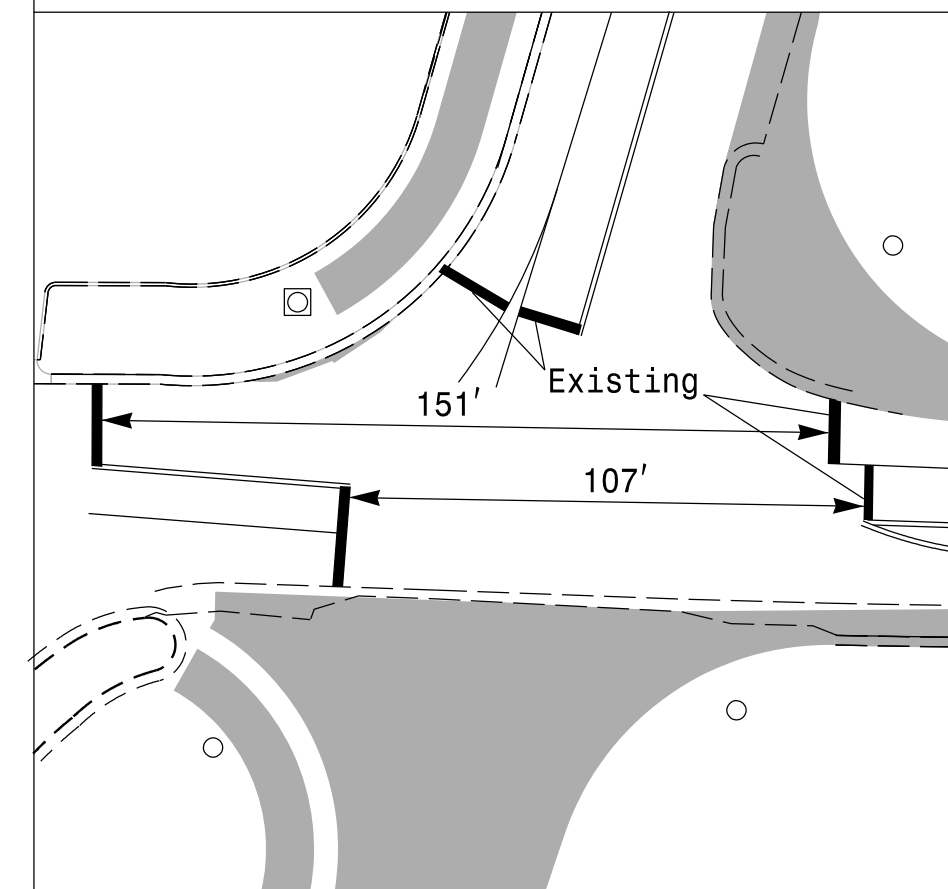
OASIS 2070 EV PREEMPT

FUNCTION	PRE 3	PRE 4	PRE 5
Interval 1 - Dwell Green	255	255	255
Interval 1 - Dwell Yellow	0.0*	0.0*	0.0*
Interval 1 - Dwell Red	0.0*	0.0*	0.0*
Interval 5 - Exit Green	1	1	1
Interval 5 - Yellow	0.0	0.0	0.0
Interval 5 - Red	0.0	0.0	0.0
Exit Phase(s)	2, 5	2, 6	2, 6
Priority	Medium	Medium	Medium
Delay Time	0	0	0
Min Green Before Pre	1	1	1
Ped Clear Before Pre	0*	0*	0*
Yellow Clear Before Pre	0.0*	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*	0.0*
Dwell Min Time	10	10	7
Enable Backup Protection	Y	N	N
Ped Clear Through Yellow	N	N	N
Omit Overlaps	-	-	-
Preempt Extend**	2	2	2

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit



STOP BAR LOCATION DIAGRAM



This plan supersedes the plan signed and sealed on 11/13/2018.

Signal Upgrade-Temporary Phase I

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:
US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis

PREPARED BY: M.L. Stygles REVIEWED BY: J. Ma

REVISIONS: INIT. DATE

SCALE: 1"=40'

3/1/2022

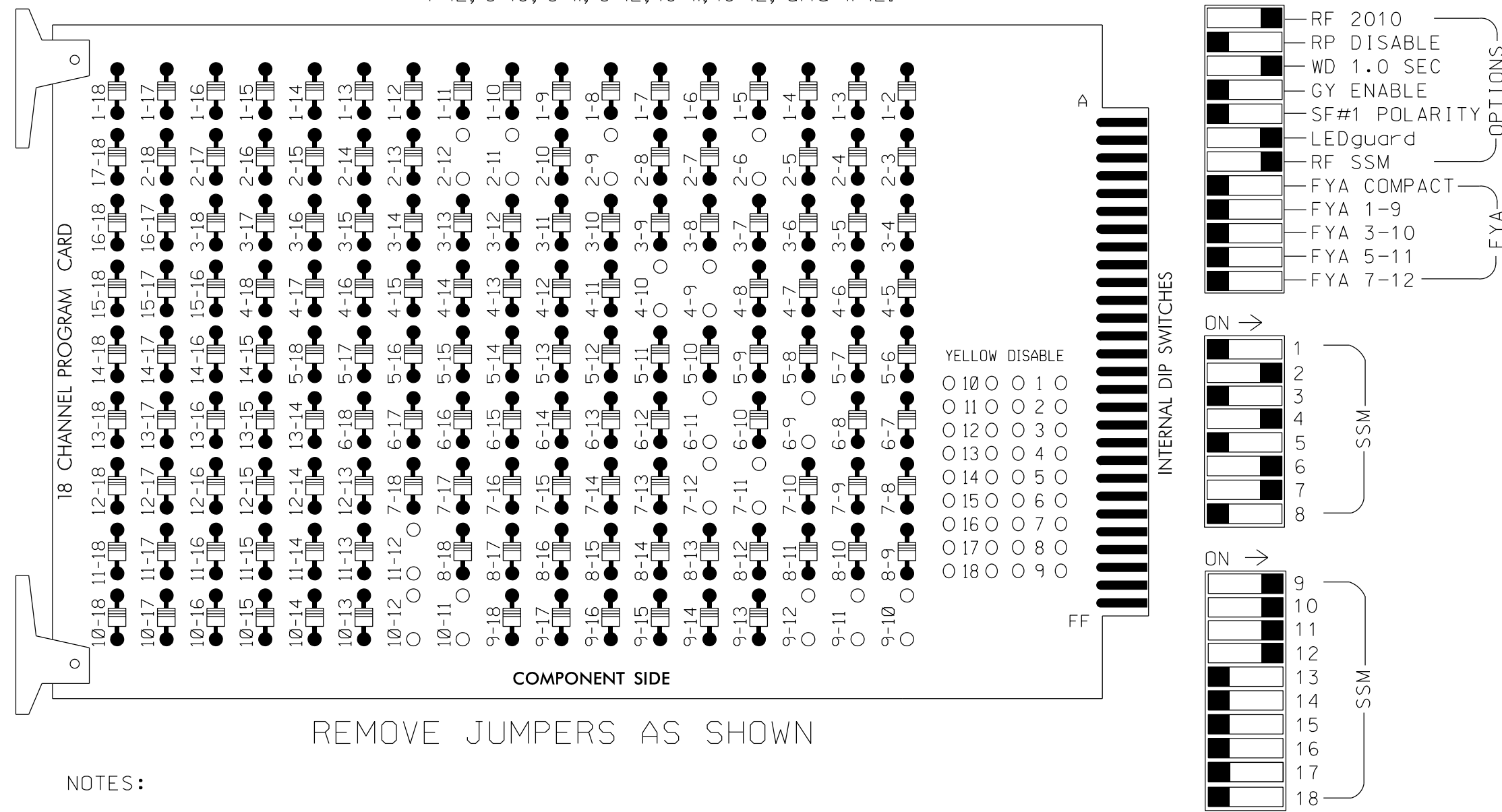
SIG. INVENTORY NO. 12-060011

vhb

VHB Engineering NC, P.C. (C-3705)
 940 Main Campus Drive, Suite 500
 Raleigh, NC 27607
 P: 919-829-0328

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL
(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 2-9, 2-11, 2-12, 4-9, 4-10, 6-9, 6-11, 7-11, 7-12, 9-10, 9-11, 9-12, 10-11, 10-12, and 11-12.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8,S10,AUX S1,
 AUX S2,AUX S4,AUX S5
 PHASES USED.....2,3*,4,5*,6,7
 OVERLAP A.....3+4+6
 OVERLAP B.....3+4
 OVERLAP C.....2+3+7
 OVERLAP D.....3+5+7

*PHASE USED FOR TIMING PURPOSES ONLY

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6			
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18			
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE			
SIGNAL HEAD NO.	NU	21,22	NU	NC	41	42	NU	NC	61,62	NU	71	72	NU	NU	63,64	63	NU	23,24	51	NU	
RED		128			101	101			134		122	122			A121	*		A114			
YELLOW		129			102	102			135		123	123			A122			A115			
GREEN		130			103	103			136		124	124			A123			A116			
RED ARROW																					A101
YELLOW ARROW															A125						A102
GREEN ARROW					103						124				A126						A103

NU = Not Used

NC = Not Connected

* Denotes install load resistor. See load resistor installation detail this sheet.

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

- From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
- From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

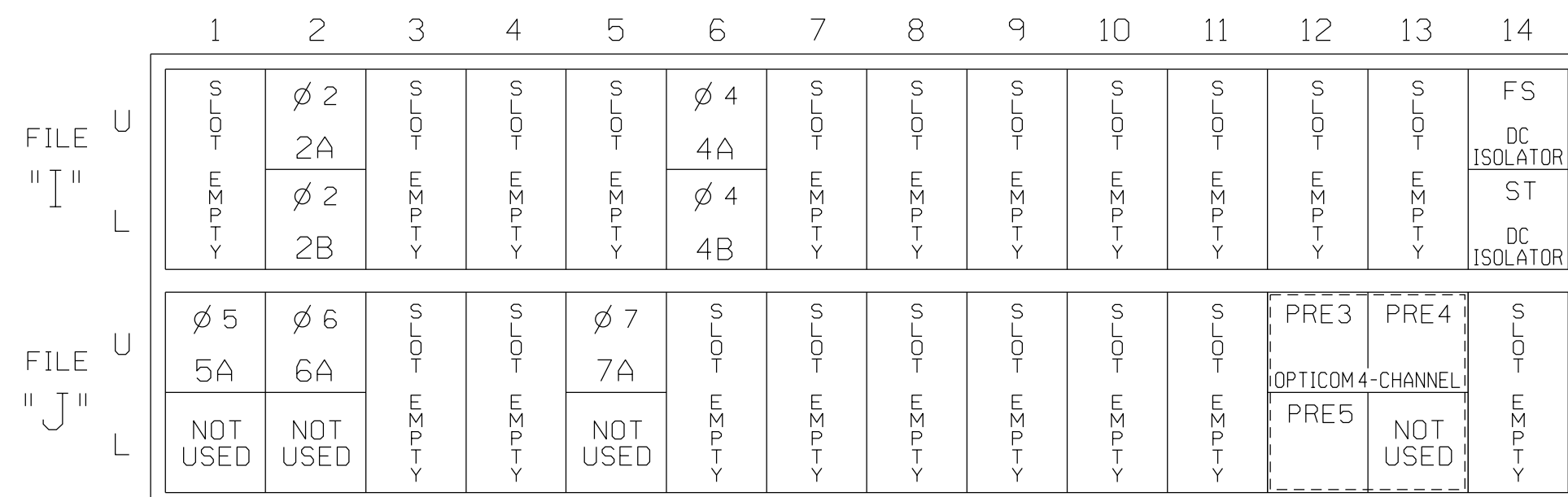
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DYNAMIC/BACKUP CONTROL FUNCTION #01
OVERLAPS: ABCDEFGHIJKLMNPO
IF OVERLAPS ARE ACTIVE !
OR PHASES: 12345678910111213141516
IF PHASES ARE ON: X
OMIT PHASES: XX X
CALL PHASES: X
    
```

BACKUP PROTECTION PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)



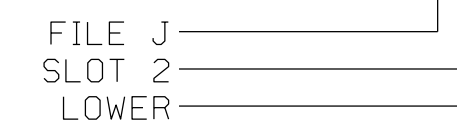
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	* 2	12U	39	1	2	2	Y	Y			
2B	* 2	12L	43	5	12	2	Y	Y			
4A	* 4	16U	41	3	4	4	Y	Y			3
4B	* 4	16L	45	7	14	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
6A	* 6	J2U	48	2	6	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			3

INPUT FILE POSITION LEGEND: J2L



*** SPECIAL DETECTOR NOTE**

For zones 2A, 2B, 4A, 4B, and 6A, install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail -Temporary Phase I-Sheet 1 of 2

Electrical and Programming Details for: **US 74 Business (Marion Street) at NC 150 (Cherryville Road)/ SR 2053 (Peach Street)**

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J. Ma

PREPARED BY: M. L. Stygles REVIEWED BY:

REVISIONS: INIT. DATE

DocuSigned by: *Marion Ma* 3/1/2022

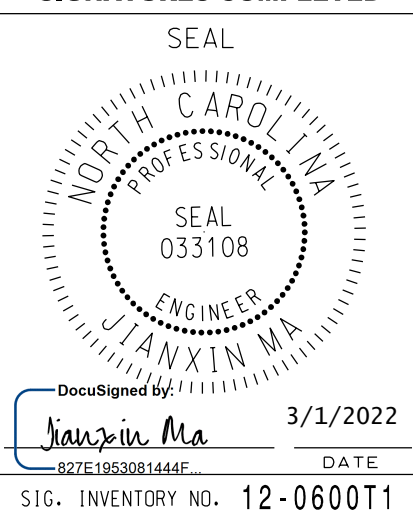
750 N. Greenfield Pkwy, Garner, NC 27529

827E1953081444E DATE

SIG. INVENTORY NO. 12-0600T1



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OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: XX X
 VEH OVL NOT VEH:
 VEH OVL NOT PED:
 VEH OVL GRN EXT:
 STARTUP COLOR: - RED - YELLOW - GREEN
 FLASH COLORS: - RED - YELLOW - GREEN
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...Y
 GREEN EXTENSION (0-255 SEC)...4
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...3.7
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...1.2
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+'

PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: XX
 VEH OVL NOT VEH:
 VEH OVL NOT PED:
 VEH OVL GRN EXT:
 STARTUP COLOR: - RED - YELLOW - GREEN
 FLASH COLORS: - RED - YELLOW - GREEN
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...N
 GREEN EXTENSION (0-255 SEC)...4
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...3.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...1.9
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+'

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: XX X
 VEH OVL NOT VEH:
 VEH OVL NOT PED:
 VEH OVL GRN EXT:
 STARTUP COLOR: - RED - YELLOW - GREEN
 FLASH COLORS: - RED - YELLOW - GREEN
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...Y
 GREEN EXTENSION (0-255 SEC)...4
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...4.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...1.3
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+'

PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: X X X
 VEH OVL NOT VEH:
 VEH OVL NOT PED:
 VEH OVL GRN EXT:
 STARTUP COLOR: - RED - YELLOW - GREEN
 FLASH COLORS: - RED - YELLOW - GREEN
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...N
 GREEN EXTENSION (0-255 SEC)...4
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...3.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...1.9
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

OVERLAP PROGRAMMING COMPLETE

EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' as needed to advance to Preempts 3, 4 and 5.

PREEMPTION #3 SETTINGS (NEXT:1-10)
 INTERVAL/TIMING CLEAR/DWELL PHASES
 GRN YEL RED 12345678910111213141516
 1 255 0.0 0.0 X X
 2 0 0.0 0.0
 3 0 0.0 0.0
 4 0 0.0 0.0
 5 1 0.0 0.0 X X
 EXIT CALLS
 OPTIONS
 PRIORITY (Y/N TO SELECT)MED
 DELAY TIMER (0-255 SEC)0
 MIN GREEN BEFORE PRE (0= DEFAULT)...1
 PED CLEAR BEFORE PRE (0= DEFAULT)...0
 YELLOW CLEAR BEFORE PRE (0= DEFAULT)...0.0
 RED CLEAR BEFORE PRE (0= DEFAULT)...0.0
 DWELL MIN TIMER (0-255 SEC)10
 DWELL MAX TIMER (0=OFF,1-255MIN) ...0
 DWELL HOLD-OVER TIMER (0-255)0
 LATCH CALL?N
 LINK TO NEXT PREEMPT?N
 ENABLE BACKUP PROTECTION?N
 HOLD CLEAR 1 PHASES DURING DELAY? ...N
 FAST GREEN FLASH DWELL PHASES?N
 PED CLEARANCE THROUGH YELLOW?N
 INHIBIT OVERLAP GREEN EXTENSION? ...N
 SERVICE DURING SOFTWARE FLASH?N
 REST IN RED DURING DWELL INTERVAL? ..N
 FLASH DWELL INTERVAL?N
 ALLOW PEDS IN DWELL INTERVAL?N
 RE-TIME DWELL INTERVAL?N
 OVERLAPS: ABCDEFGHIJKLMNPO
 DWELL INT FLASH YELLOW
 OMIT OVERLAPS:

PRESS 'NEXT'

Program extend time on optical detector unit for 2.0 seconds.

PREEMPTION #4 SETTINGS (NEXT:1-10)
 INTERVAL/TIMING CLEAR/DWELL PHASES
 GRN YEL RED 12345678910111213141516
 1 255 0.0 0.0 X X
 2 0 0.0 0.0
 3 0 0.0 0.0
 4 0 0.0 0.0
 5 1 0.0 0.0 X X
 EXIT CALLS
 OPTIONS
 PRIORITY (Y/N TO SELECT)MED
 DELAY TIMER (0-255 SEC)0
 MIN GREEN BEFORE PRE (0= DEFAULT)...1
 PED CLEAR BEFORE PRE (0= DEFAULT)...0
 YELLOW CLEAR BEFORE PRE (0= DEFAULT)...0.0
 RED CLEAR BEFORE PRE (0= DEFAULT)...0.0
 DWELL MIN TIMER (0-255 SEC)10
 DWELL MAX TIMER (0=OFF,1-255MIN) ...0
 DWELL HOLD-OVER TIMER (0-255)0
 LATCH CALL?N
 LINK TO NEXT PREEMPT?N
 ENABLE BACKUP PROTECTION?N
 HOLD CLEAR 1 PHASES DURING DELAY? ...N
 FAST GREEN FLASH DWELL PHASES?N
 PED CLEARANCE THROUGH YELLOW?N
 INHIBIT OVERLAP GREEN EXTENSION? ...N
 SERVICE DURING SOFTWARE FLASH?N
 REST IN RED DURING DWELL INTERVAL? ..N
 FLASH DWELL INTERVAL?N
 ALLOW PEDS IN DWELL INTERVAL?N
 RE-TIME DWELL INTERVAL?N
 OVERLAPS: ABCDEFGHIJKLMNPO
 DWELL INT FLASH YELLOW
 OMIT OVERLAPS:

PRESS 'NEXT'

PREEMPTION #5 SETTINGS (NEXT:1-10)
 INTERVAL/TIMING CLEAR/DWELL PHASES
 GRN YEL RED 12345678910111213141516
 1 255 0.0 0.0 X
 2 0 0.0 0.0
 3 0 0.0 0.0
 4 0 0.0 0.0
 5 1 0.0 0.0 X
 EXIT CALLS
 OPTIONS
 PRIORITY (Y/N TO SELECT)MED
 DELAY TIMER (0-255 SEC)0
 MIN GREEN BEFORE PRE (0= DEFAULT)...1
 PED CLEAR BEFORE PRE (0= DEFAULT)...0
 YELLOW CLEAR BEFORE PRE (0= DEFAULT)...0.0
 RED CLEAR BEFORE PRE (0= DEFAULT)...0.0
 DWELL MIN TIMER (0-255 SEC)7
 DWELL MAX TIMER (0=OFF,1-255MIN) ...0
 DWELL HOLD-OVER TIMER (0-255)0
 LATCH CALL?N
 LINK TO NEXT PREEMPT?N
 ENABLE BACKUP PROTECTION?N
 HOLD CLEAR 1 PHASES DURING DELAY? ...N
 FAST GREEN FLASH DWELL PHASES?N
 PED CLEARANCE THROUGH YELLOW?N
 INHIBIT OVERLAP GREEN EXTENSION? ...N
 SERVICE DURING SOFTWARE FLASH?N
 REST IN RED DURING DWELL INTERVAL? ..N
 FLASH DWELL INTERVAL?N
 ALLOW PEDS IN DWELL INTERVAL?N
 RE-TIME DWELL INTERVAL?N
 OVERLAPS: ABCDEFGHIJKLMNPO
 DWELL INT FLASH YELLOW
 OMIT OVERLAPS:

PROGRAMMING COMPLETE

PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

FROM DASH LOCAL CONTROLLER MAIN MENU
 SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)												
RNG	LEAD	BARRIER 1	X-LAG	LEAD	BARRIER 2	X-LAG	LEAD	BARRIER 3	X-LAG	LEAD	BARRIER 4	X-LAG
1	10	2	0	0	13	0	0	0	14	0	17	0
2	15	6	0	0	0	0	0	0	10	0	0	0
3	10	0	0	0	0	0	0	0	10	0	0	0
4	10	0	0	0	0	0	0	0	10	0	0	0

This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail -Temporary Phase I-Sheet 2 of 2

Electrical and Programming Details for: US 74 Business (Marion Street) at NC 150 (Cherryville Road)/ SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J. Ma

PREPARED BY: M. L. Stygles REVIEWED BY:

REVISIONS

INIT. DATE

DocuSign by: 3/1/2022

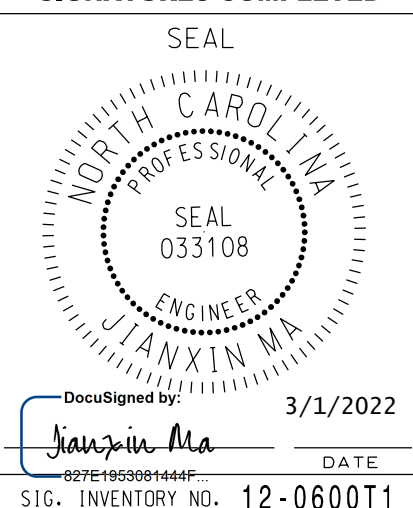
Signature: J. Ma

SIG. INVENTORY NO. 12-0600T1

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600T1
 DESIGNED: March 2022
 SEALED: 03/01/2022
 REVISED: N/A



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



8 Phase Fully Actuated w/ EV Preemption (Isolated)

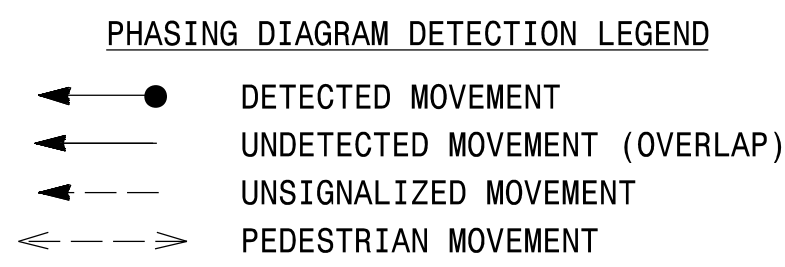
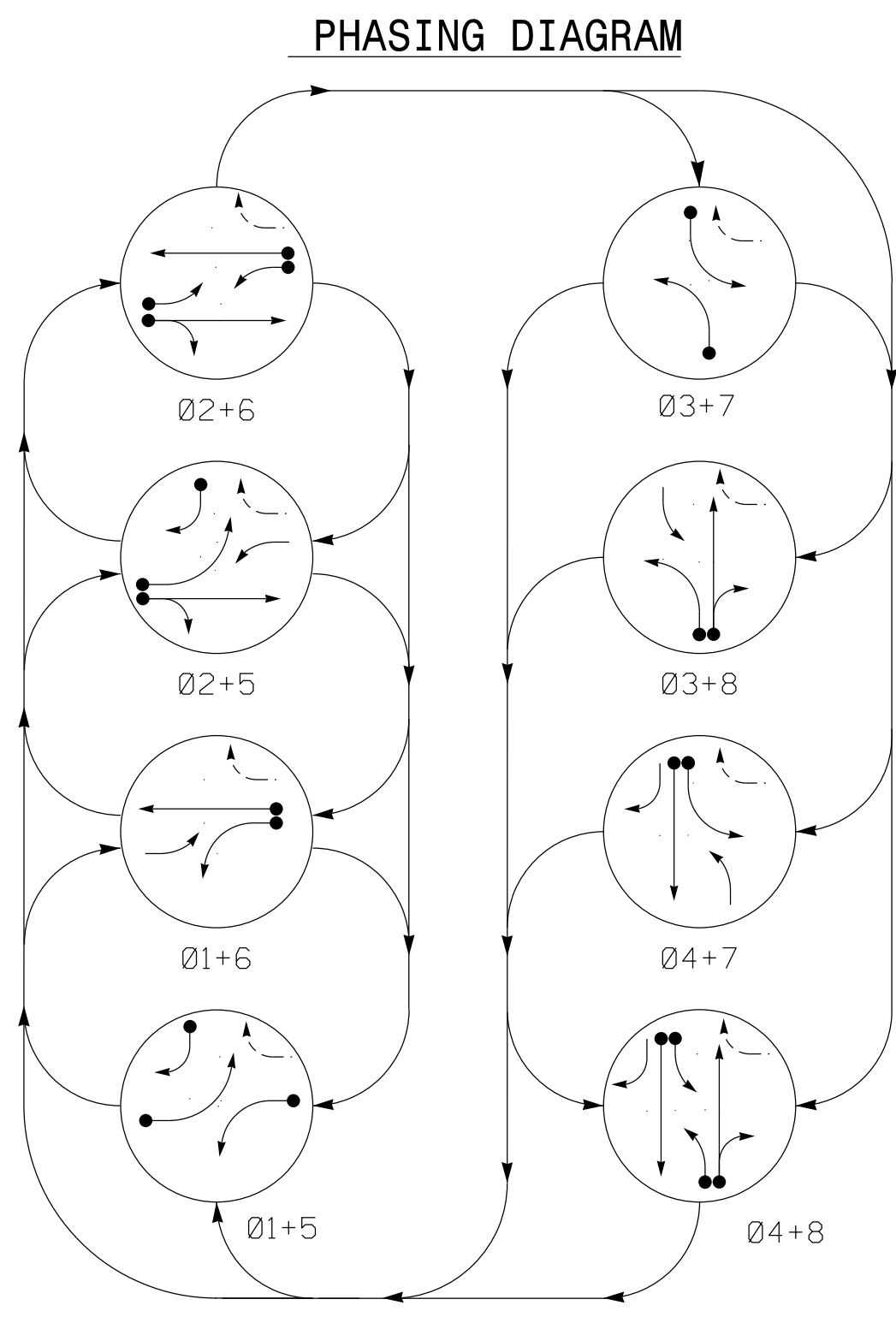
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018. The PSP can be accessed at the following website: <http://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or Phase 5 may be lagged.
- Phase 3 and/or Phase 7 may be lagged.
- Set all detector units to presence mode.
- This intersection features an optical preemption system. Shown locations of optical detector are conceptual only.
- The Division traffic engineer will determine the Delay before Preempt and preempt Dwell Min Green time for the emergency vehicle preemption timing.
- Optical Detector 10 calls EVP 3, Optical Detector 20 calls EVP 4, Optical Detector 30 calls EVP 5.
- Incorporate Video Detection system for vehicle detection.
- Provide the Engineer with the Manufacturer's approved Video Detection locations and mounting heights as shown.

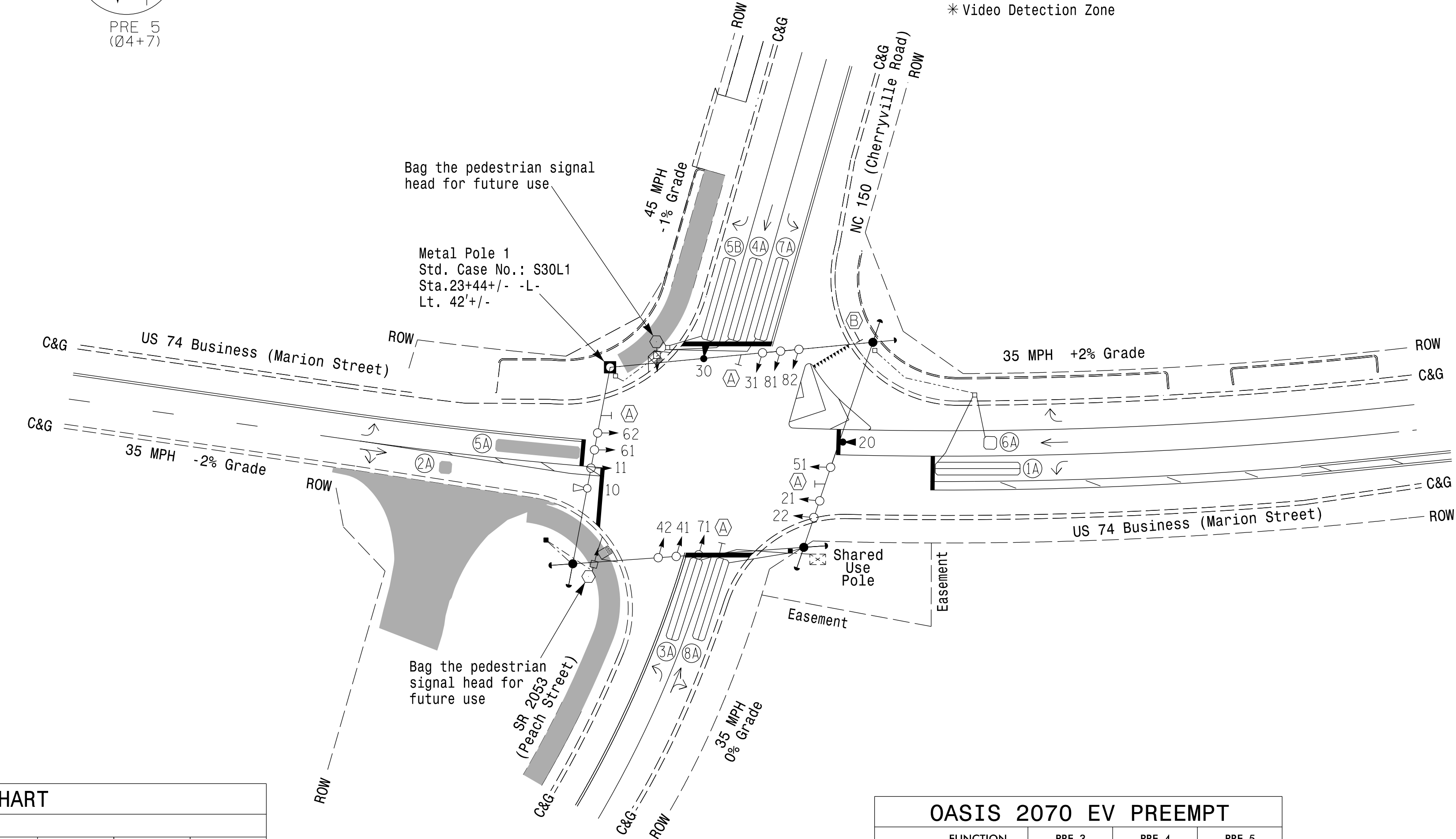
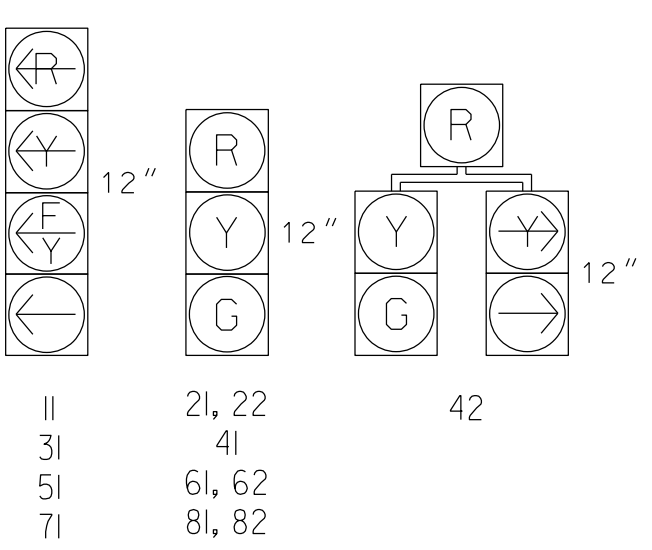
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY			
1A	6X40	0	2-4-2	Y	1	Y	Y	-	15	-	Y
2A	6X6	70	*	*	2	Y	Y	-	-	-	*
3A	6X40	0	2-4-2	Y	3	Y	Y	-	15	-	Y
4A	6X40	0	2-4-2	Y	8	Y	Y	-	3	-	Y
5A	6X40	0	*	*	4	Y	Y	-	-	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	15	-	*
6A	6X6	70	4	Y	6	Y	Y	-	-	-	-
7A	6X40	0	2-4-2	Y	4	Y	Y	-	3	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	10	-	Y

* Video Detection Zone

SIGNAL FACE	PHASE											
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	PRES	P	P	FLASH
11	←	←	←	←	←	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	R	R	G	R	R	Y
31	←	←	←	←	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	R	G	R	R	R	G
42	R	R	R	R	R	R	R	G	R	R	R	G
51	←	←	←	←	←	←	←	←	←	←	←	←
61, 62	R	G	R	G	R	R	R	R	R	G	R	Y
71	←	←	←	←	←	←	←	←	←	←	←	←
81, 82	R	R	R	R	R	R	G	R	G	R	R	R



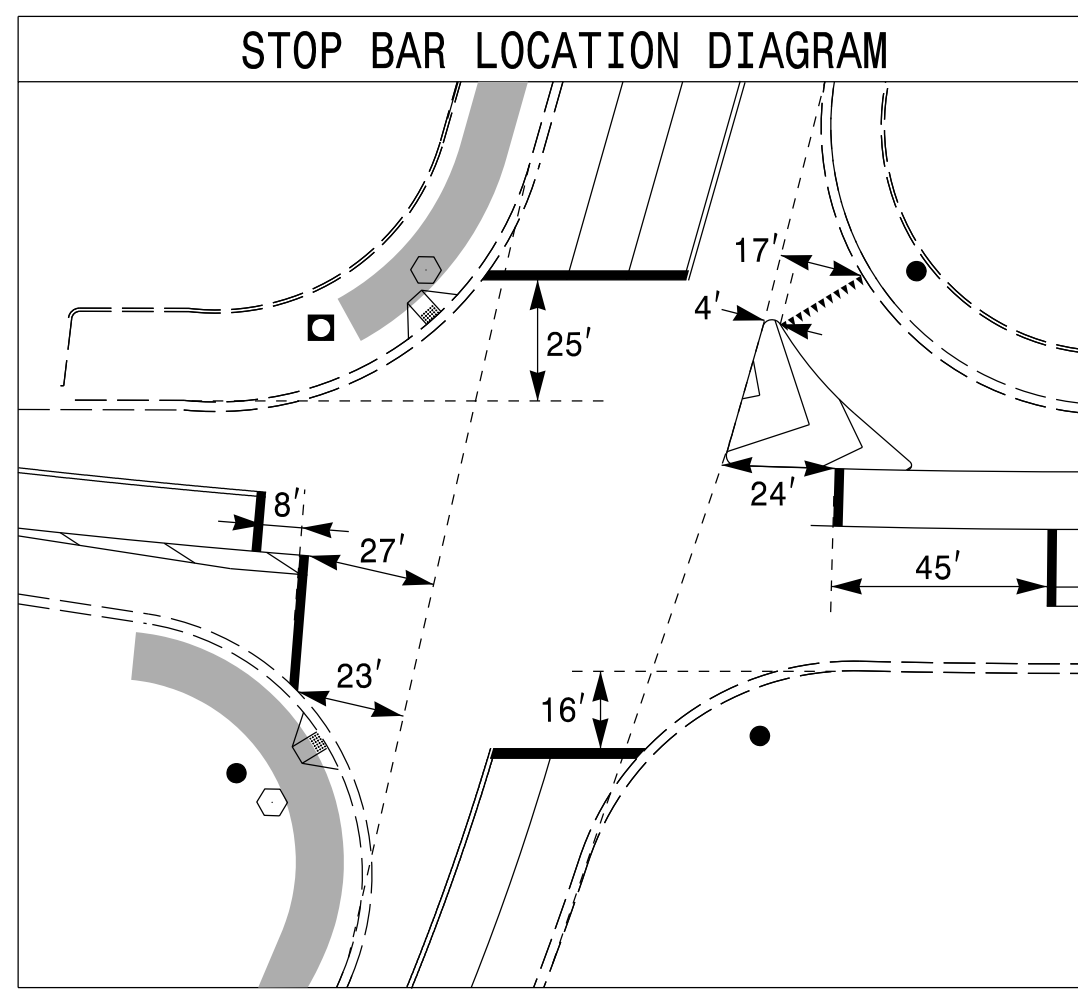
SIGNAL FACE I.D.



PROPOSED	EXISTING
	N/A

FEATURE	OASIS 2070 TIMING CHART							
	1	2	3	4	5	6	7	8
Min Green 1*	7	10	7	7	7	10	7	7
Extension 1*	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max Green 1*	15	45	15	25	15	45	15	25
Yellow Clearance	3.0	4.0	3.0	4.6	3.0	4.0	3.0	4.6
Red Clearance	3.5	2.8	2.1	1.3	2.9	2.8	2.4	1.3
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1*	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Walk Advance Time	-	-	-	-	-	-	-	-
Seconds Per Actuation*	-	-	-	-	-	-	-	-
Max Variable Initial*	-	-	-	-	-	-	-	-
Time Before Reduction*	-	-	-	-	-	-	-	-
Time To Reduce*	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



FUNCTION	PRE 3	PRE 4	PRE 5
Interval 1 - Dwell Green	255	255	255
Interval 1 - Dwell Yellow	0.0*	0.0*	0.0*
Interval 1 - Dwell Red	0.0*	0.0*	0.0*
Interval 5 - Exit Green	1	1	1
Interval 5 - Yellow	0.0	0.0	0.0
Interval 5 - Red	0.0	0.0	0.0
Exit Phase(s)	2+6	2+6	4+8
Priority	Medium	Medium	Medium
Delay Time	0	0	0
Min Green Before Pre	1	1	1
Ped Clear Before Pre	0*	0*	0*
Yellow Clear Before Pre	0.0*	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*	0.0*
Dwell Min Time	10	10	7
Enable Backup Protection	N	N	N
Ped Clear Through Yellow	N	N	N
Omit Overlaps	-	-	-
Preempt Extend**	2	2	2

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit

This plan supersedes the plan signed and sealed on 11/13/2018.

Signal Upgrade-Temporary Phase II

US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis

PREPARED BY: J. Ma REVIEWED BY: M. L. Styles

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 0 40 1"=40'

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER J. L. Lewis 033108

3/1/2022

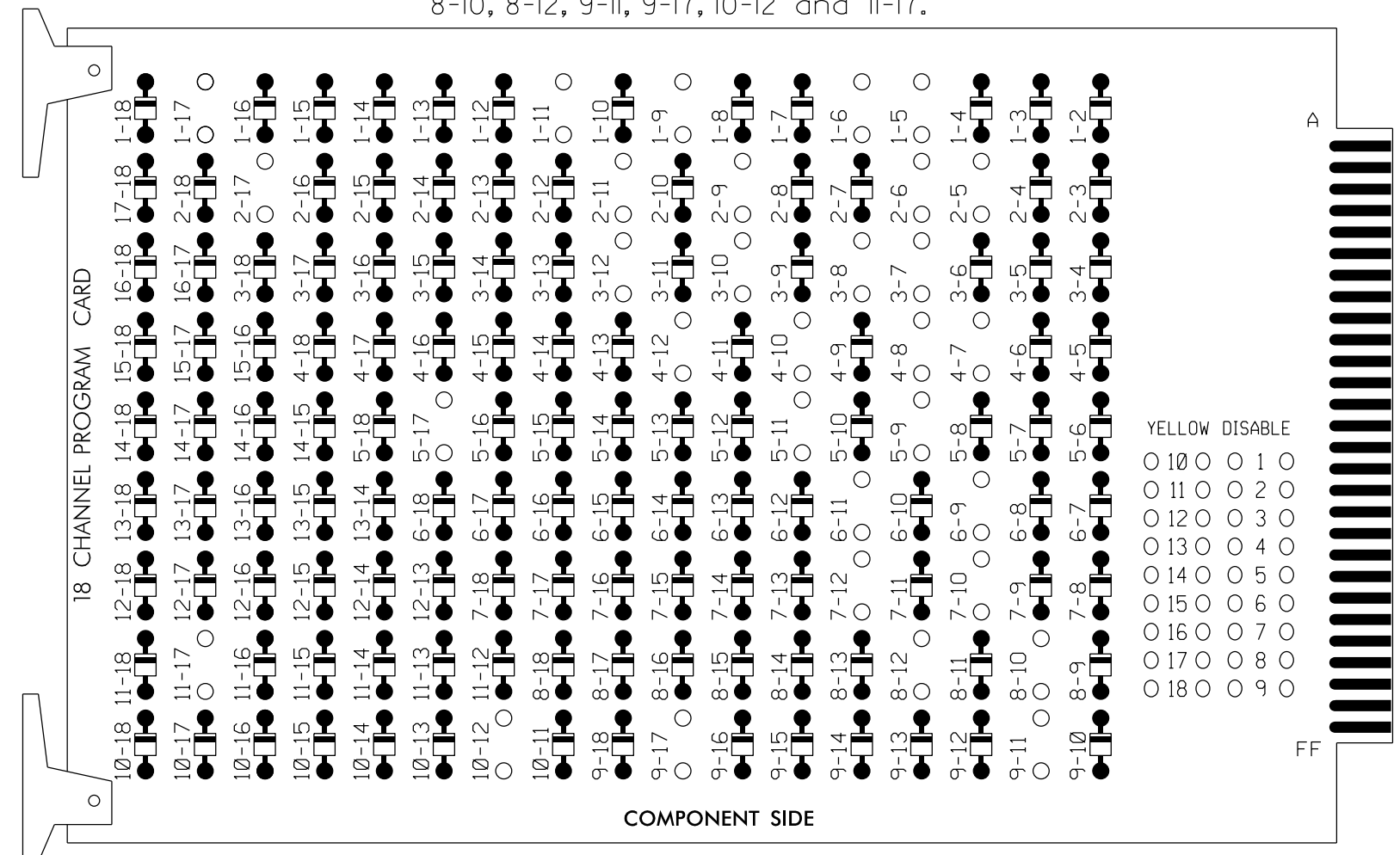
SIG. INVENTORY NO. 12-0600T2



EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-17, 2-5, 2-6, 2-9, 2-11, 2-17, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 5-17, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11, 9-17, 10-12 and 11-17.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11,AUX S1,
 AUX S2,AUX S3,AUX S4,AUX S5
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP "A".....1+2
 OVERLAP "B".....3+4
 OVERLAP "C".....5+6
 OVERLAP "D".....7+8
 OVERLAP "E".....5

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	OLE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	41,42	NU	51	61,62	NU	71	81,82	NU	11	31	42	51	71	NU
RED		128			101			134			107				*			
YELLOW	*	129		*	102		*	135		*	108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125	A112	A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127			118			133			124					A113			

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

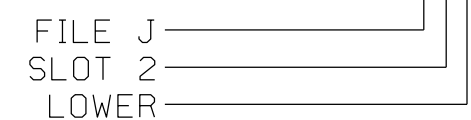
★ See pictorial of head wiring in detail this sheet.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
2A	*	J4U	48	10	26	6	Y	Y			
3A ²	TB4-5,6	I5U	58	20	3	3	Y	Y			15
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A ³	*	J1U	55	17	5	5	Y	Y			15
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
7A ⁴	TB5-5,6	J5U	57	19	7	7	Y	Y			15
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from I5-W to J8-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.
- Add jumper from J5-W to I8-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L

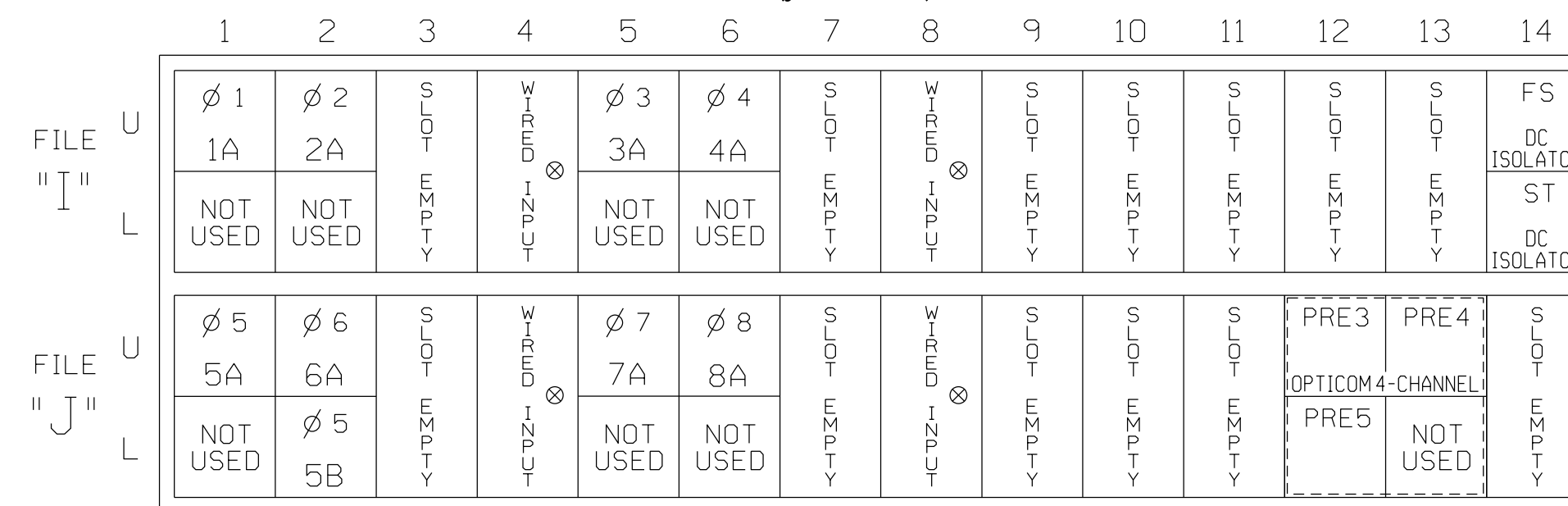


*** SPECIAL DETECTOR NOTE**

For zones 2A and 5A, install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

INPUT FILE POSITION LAYOUT

(front view)



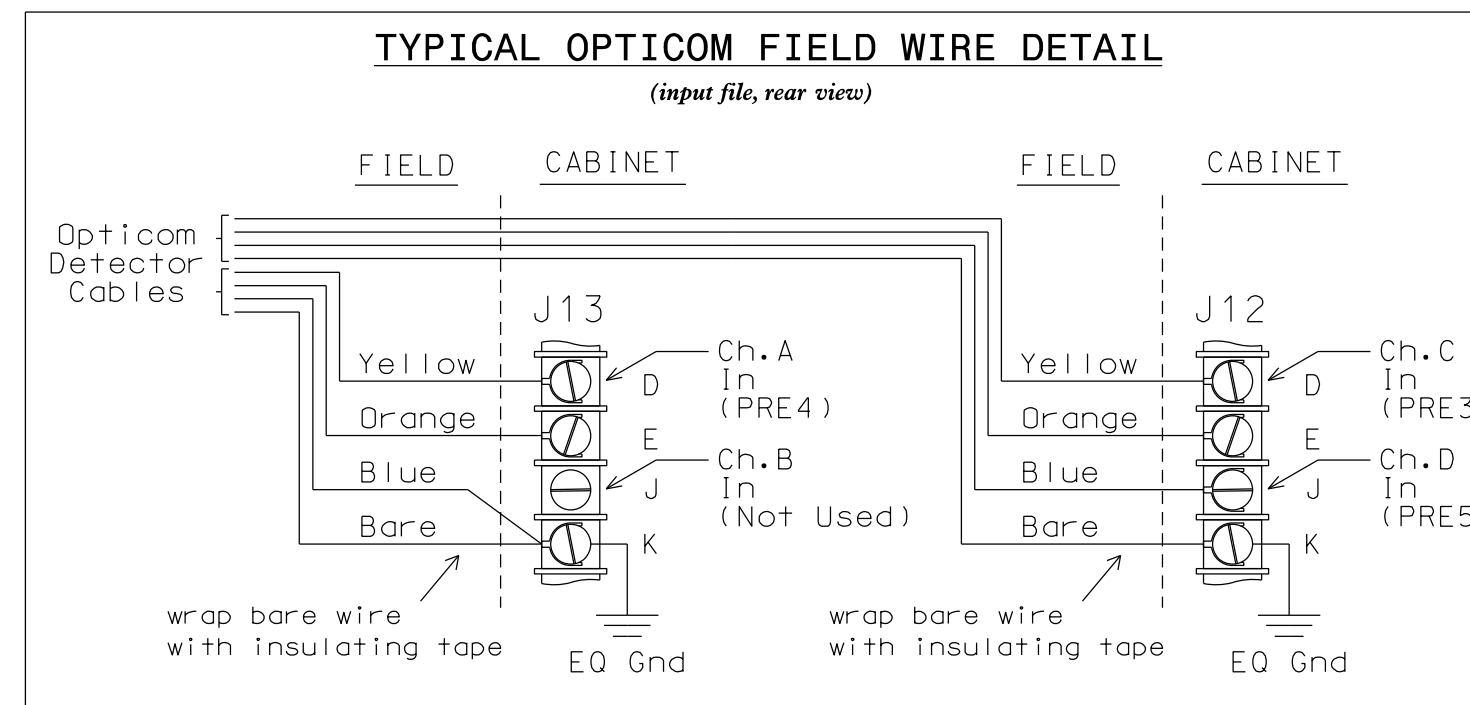
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

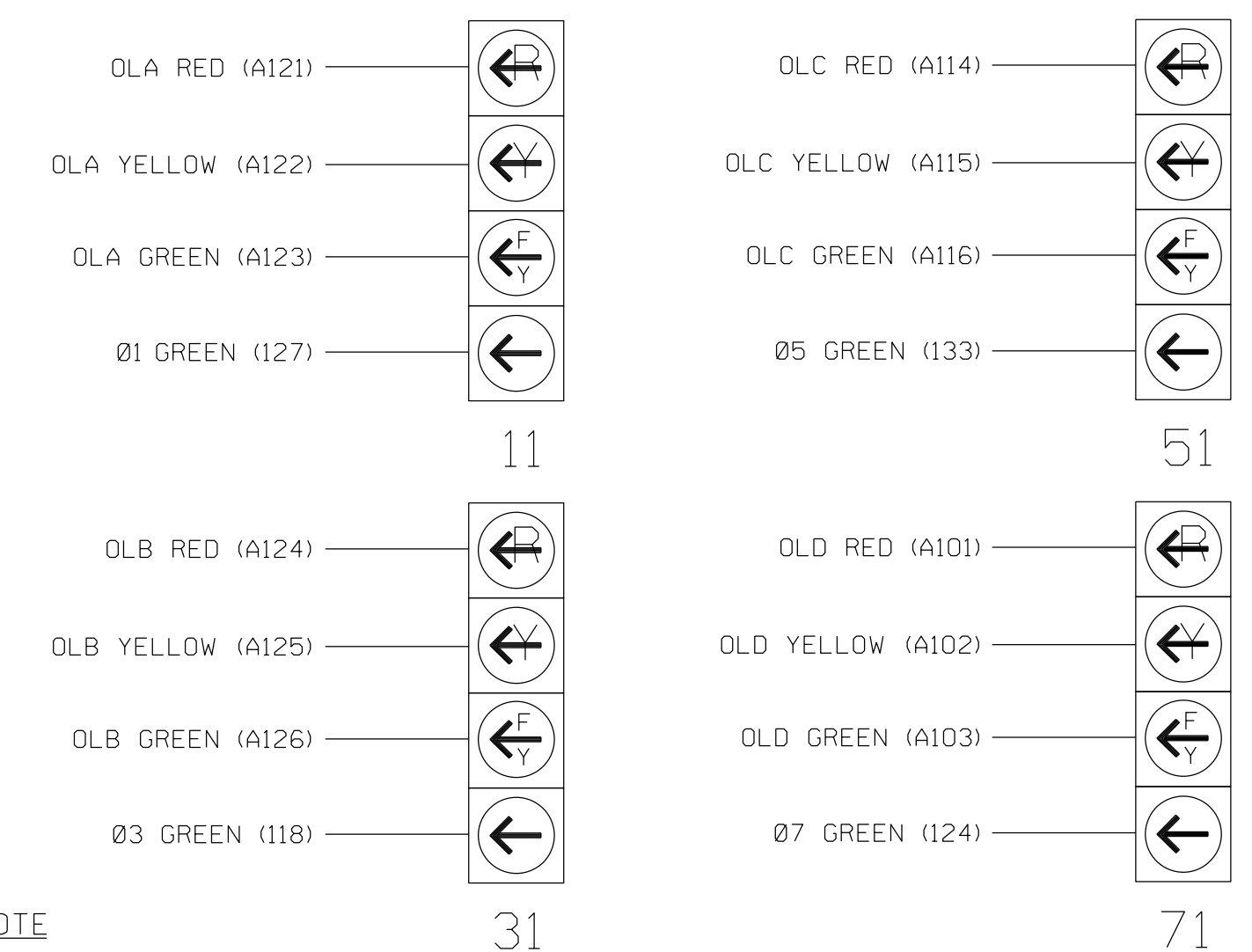
TYPICAL OPTICOM FIELD WIRE DETAIL

(input file, rear view)



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

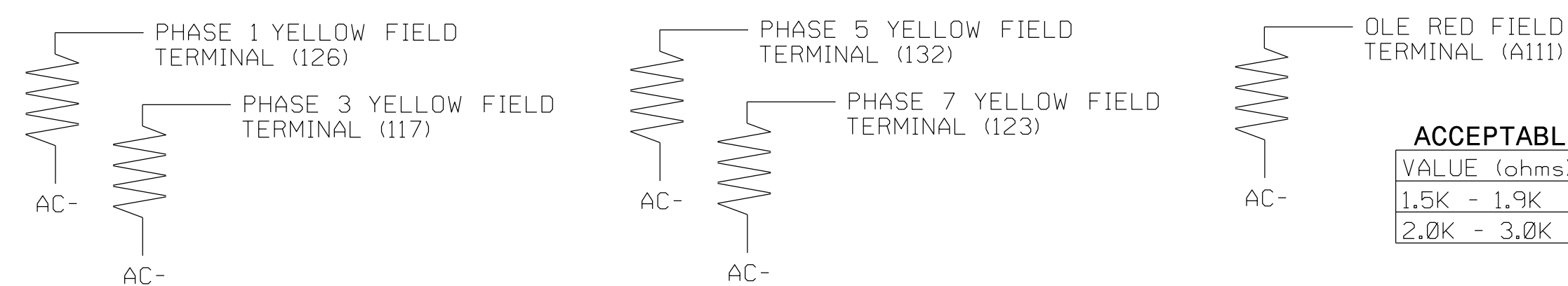


NOTE

The sequence display for signal heads 11, 31, 51, and 71 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600T2
 DESIGNED: March 2022
 SEALED: 03/01/2022
 REVISED: N/A

This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail-Temporary Phase II-Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

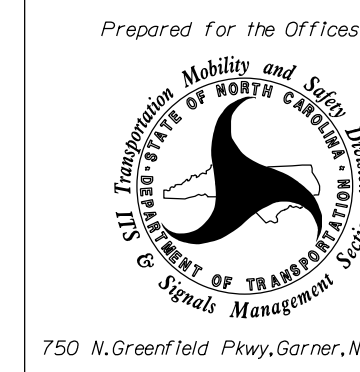
US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

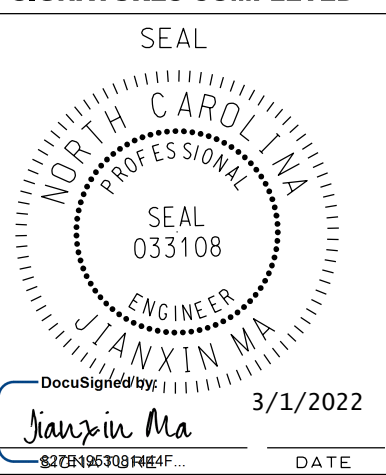
PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis

PREPARED BY: J. Ma REVIEWED BY: M.L. Stygles

REVISIONS INIT. DATE



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SIG. INVENTORY NO. 12-0600T2



LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, AND 12.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON
AND RED CLEAR ON PHASE #1 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #50 ON
SET OUTPUT ASSIGNMENT #51 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #1 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #51 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
AND RED CLEAR ON PHASE #5 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #42 ON
SET OUTPUT ASSIGNMENT #43 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

LOGICAL I/O COMMAND #5 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGICAL I/O COMMAND #7 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON
AND RED CLEAR ON PHASE #3 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #47 ON
SET OUTPUT ASSIGNMENT #48 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 4 (HEAD 31).

LOGICAL I/O COMMAND #8 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #49 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 31).

LOGICAL I/O COMMAND #9 (+/-COMMAND#)
IF YELLOW ON PHASE #3 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #48 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

LOGICAL I/O COMMAND #10 (+/-COMMAND#)
IF ACTIVE PHASE #7 IS ON
AND RED CLEAR ON PHASE #7 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #39 ON
SET OUTPUT ASSIGNMENT #40 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 8 (HEAD 71).

LOGICAL I/O COMMAND #11 (+/-COMMAND#)
IF ACTIVE PHASE #7 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #41 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 71).

LOGICAL I/O COMMAND #12 (+/-COMMAND#)
IF YELLOW ON PHASE #7 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #40 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 71).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: XX
VEH OVL NOT PED: XX
VEH OVL GRN EXT: XX
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+'

← NOTICE GREEN FLASH

PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: XX
VEH OVL NOT PED: XX
VEH OVL GRN EXT: XX
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+'

← NOTICE GREEN FLASH

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: XX
VEH OVL NOT PED: XX
VEH OVL GRN EXT: XX
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+'

← NOTICE GREEN FLASH

PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: XX
VEH OVL NOT PED: XX
VEH OVL GRN EXT: XX
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+'

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

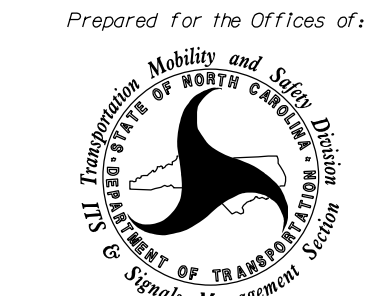
OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600T2
DESIGNED: March 2022
SEALED: 03/01/2022
REVISED: N/A

This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail-Temporary Phase II-Sheet 2 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**US 74 Bus. (Marion Street)
at
NC 150 (Cherryville Road) /
SR 2053 (Peach Street)**

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis
PREPARED BY: J. Ma REVIEWED BY: M.L. Styles

REVISIONS	INIT.	DATE



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J. MA
033108
3/1/2022
J. Ma
DATE

SIG. INVENTORY NO. 12-0600T2

EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' as needed to advance to Preempts 3, 4 and 5.

PREEMPTION #3	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 255 0.0 0.0	X X
2 0 0.0 0.0	
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	MED
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	0.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	0.0
DWELL MIN TIMER (0-255 SEC)	10
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ..	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION?	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	X

PRESS 'NEXT'

PREEMPTION #4	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 255 0.0 0.0	X X
2 0 0.0 0.0	
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	MED
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	0.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	0.0
DWELL MIN TIMER (0-255 SEC)	10
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ..	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION?	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	

PRESS 'NEXT'

PREEMPTION #5	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 255 0.0 0.0	X X
2 0 0.0 0.0	
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	MED
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	0.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	0.0
DWELL MIN TIMER (0-255 SEC)	7
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ..	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION?	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	

PROGRAMMING COMPLETE

Program extend time on optical detector unit for 2.0 seconds.

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO ENSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600T2
 DESIGNED: March 2022
 SEALED: 03/01/2022
 REVISED: N/A

This plan supersedes the plan signed and sealed on 11/13/2018.

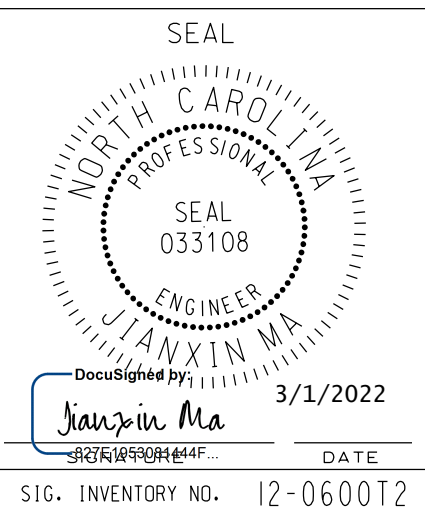
Electrical Detail-Temporary Phase II-Sheet 3 of 4



ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)	
PLAN DATE:	March 2022	REVIEWED BY:	J.L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M.L. Stygles
REVISIONS	INIT.	DATE	



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



OVERLAP "E" OUTPUT ASSIGNMENT PROGRAMMING DETAIL *(program controller as shown below)*

- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS).
- WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 45, AS SHOWN BELOW.
- PROGRAM CONTROLLER AS SHOWN:

```

PAGE:1 C1 PIN:91 NOT ENABLED
OUTPUT ASSIGNMENT #.....45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

EXISTING DEFAULT ENTRY

```

PAGE:1 C1 PIN:91 NOT ENABLED
SELECT VEHICLE OVERLAP (A=1, P=16)...5
SELECT COLOR (0=RED,1=YEL,2=GRN)...0
    
```

WHEN A "Y" IS ENTERED FOR "VEHICLE OVERLAP"
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.
PRESS ENTER AFTER ENTERING DATA, THEN ESC.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "VEHICLE OVERLAP" AS SHOWN BELOW:

```

PAGE:1 C1 PIN:91 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

VEHICLE OVERLAP E (RED) LOAD SWITCH AUX S3

- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS).
- WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 46, AS SHOWN BELOW.
- PROGRAM CONTROLLER AS SHOWN:

```

PAGE:1 C1 PIN:93 NOT ENABLED
OUTPUT ASSIGNMENT #.....46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

EXISTING DEFAULT ENTRY

```

PAGE:1 C1 PIN:93 NOT ENABLED
SELECT VEHICLE OVERLAP (A=1, P=16)...5
SELECT COLOR (0=RED,1=YEL,2=GRN)...2
    
```

WHEN A "Y" IS ENTERED FOR "VEHICLE OVERLAP"
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.
PRESS ENTER AFTER ENTERING DATA, THEN ESC.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "VEHICLE OVERLAP" AS SHOWN BELOW:

```

PAGE:1 C1 PIN:93 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

VEHICLE OVERLAP E (GREEN) LOAD SWITCH AUX S3

- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS).
- WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 54, AS SHOWN BELOW.
- PROGRAM CONTROLLER AS SHOWN:

```

PAGE:1 C1 PIN:101 CONTROLLER FLASH
OUTPUT ASSIGNMENT #.....54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

EXISTING DEFAULT ENTRY

```

PAGE:1 C1 PIN:101 CONTROLLER FLASH
SELECT VEHICLE OVERLAP (A=1, P=16)...5
SELECT COLOR (0=RED,1=YEL,2=GRN)...1
    
```

WHEN A "Y" IS ENTERED FOR "VEHICLE OVERLAP"
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.
PRESS ENTER AFTER ENTERING DATA, THEN ESC.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "VEHICLE OVERLAP" AS SHOWN BELOW:

```

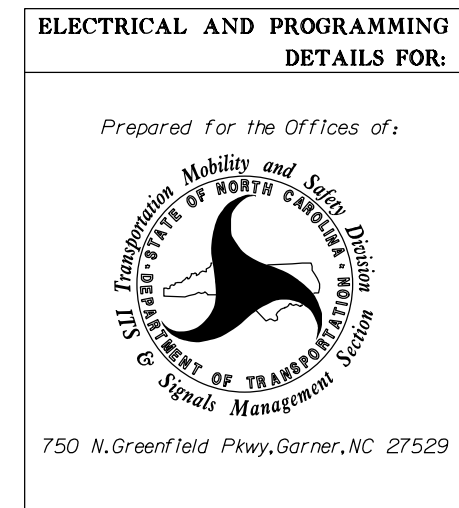
PAGE:1 C1 PIN:101 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

VEHICLE OVERLAP E (YELLOW) LOAD SWITCH AUX S3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600T2
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This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail-Temporary Phase II-Sheet 4 of 4



ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)	
Division 12		Cleveland County	Shelby
PLAN DATE: March 2022	REVIEWED BY: J.L. Lewis		
PREPARED BY: J. Ma	REVIEWED BY: M.L. Stygles		
REVISIONS	INIT.	DATE	



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NORTH CAROLINA PROFESSIONAL ENGINEERS

J. L. Lewis

033108

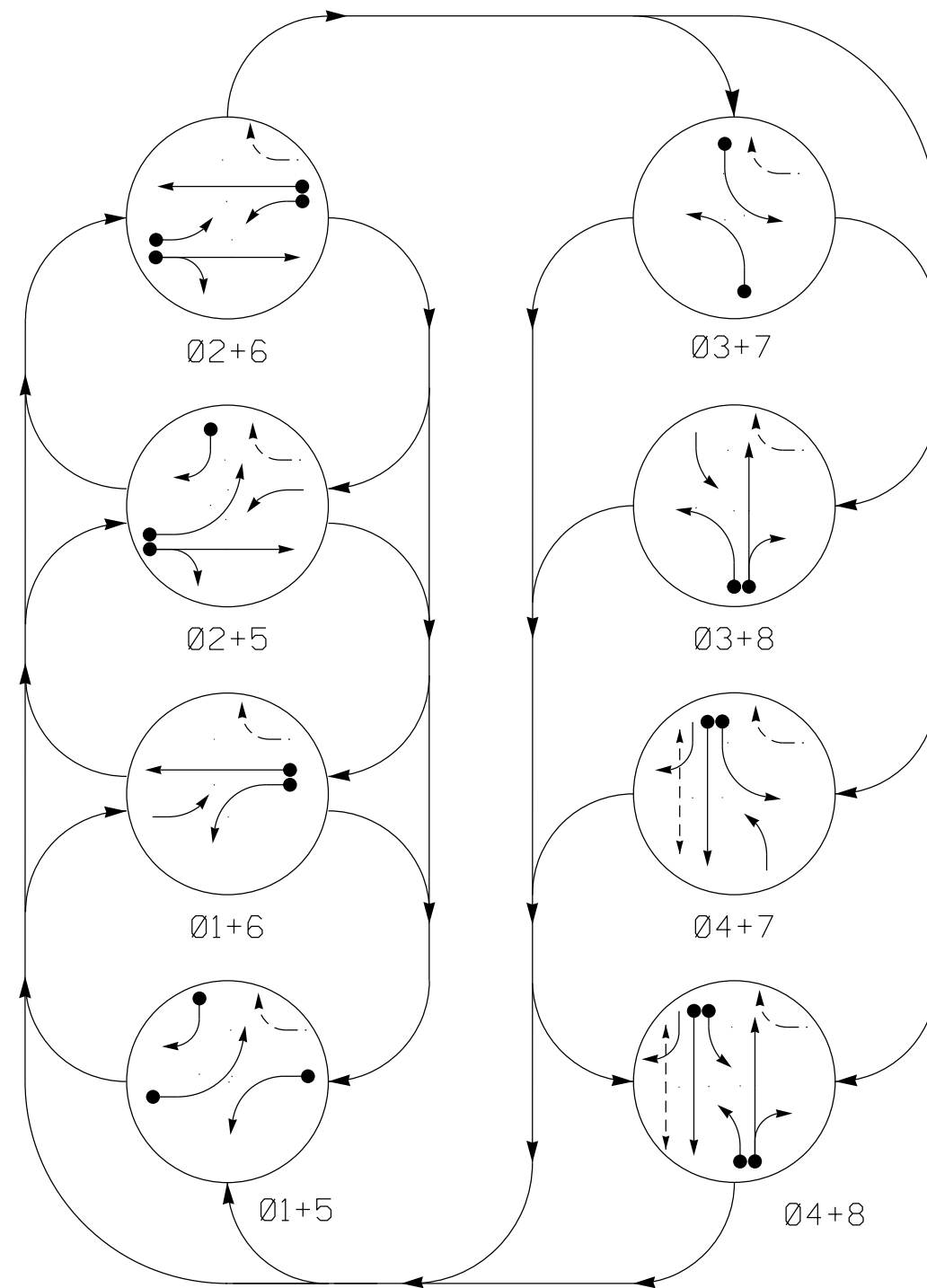
JANXIN MA

3/1/2022

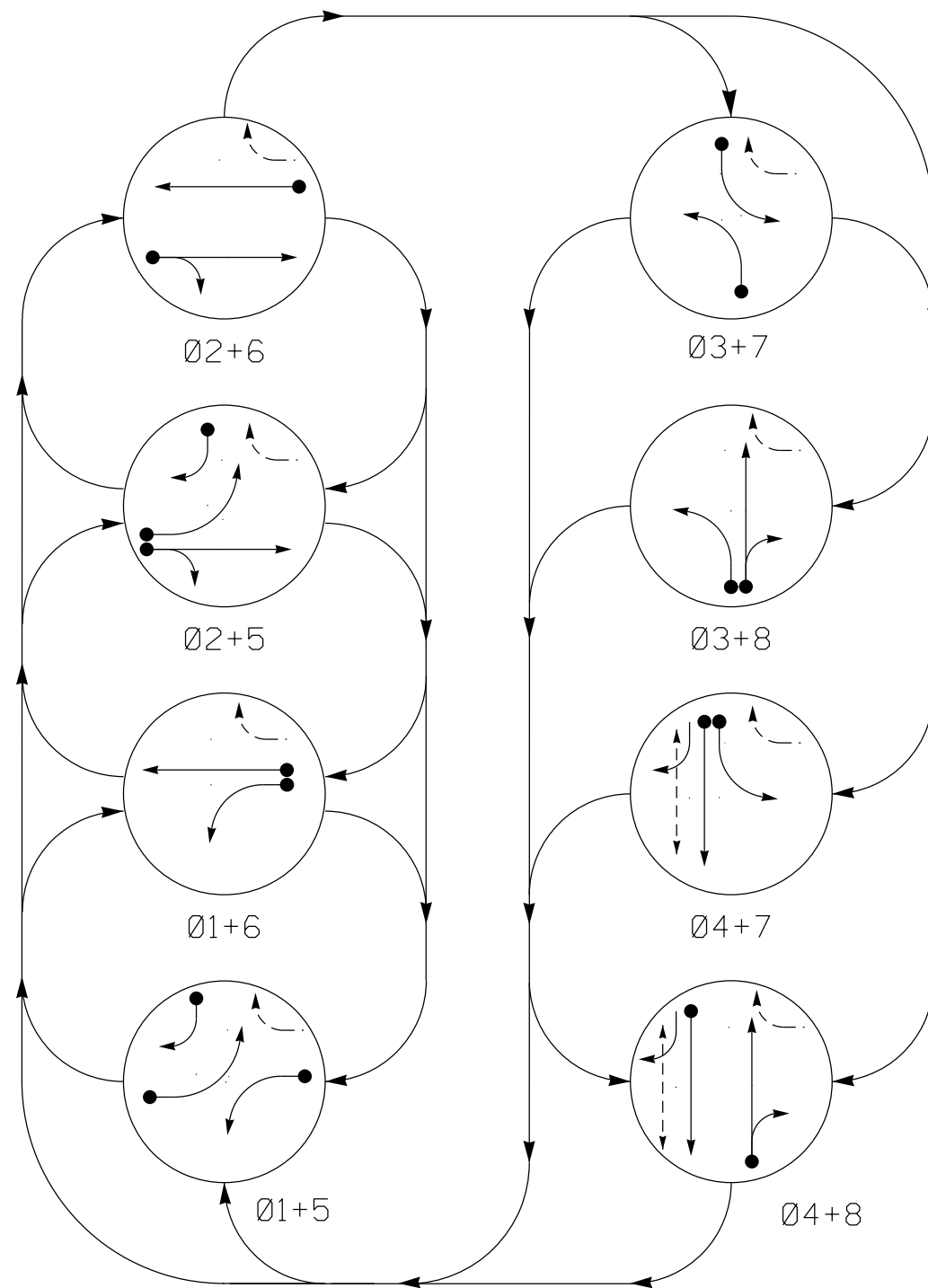
DATE

SIG. INVENTORY NO. 12-0600T2

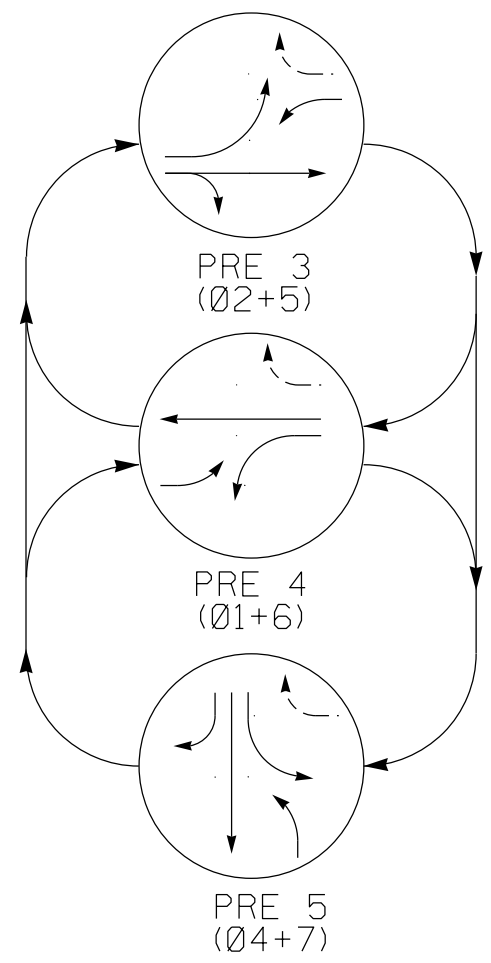
DEFAULT PHASING DIAGRAM



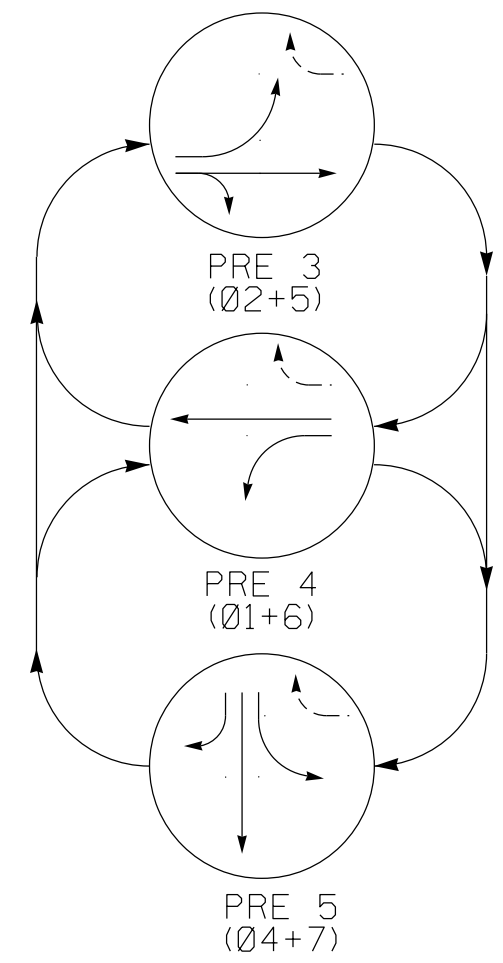
ALTERNATE PHASING DIAGRAM



DEFAULT PHASING EV PREEMPT PHASES (Medium Priority)



ALTERNATE PHASING EV PREEMPT PHASES (Medium Priority)



PHASING DIAGRAM DETECTION LEGEND

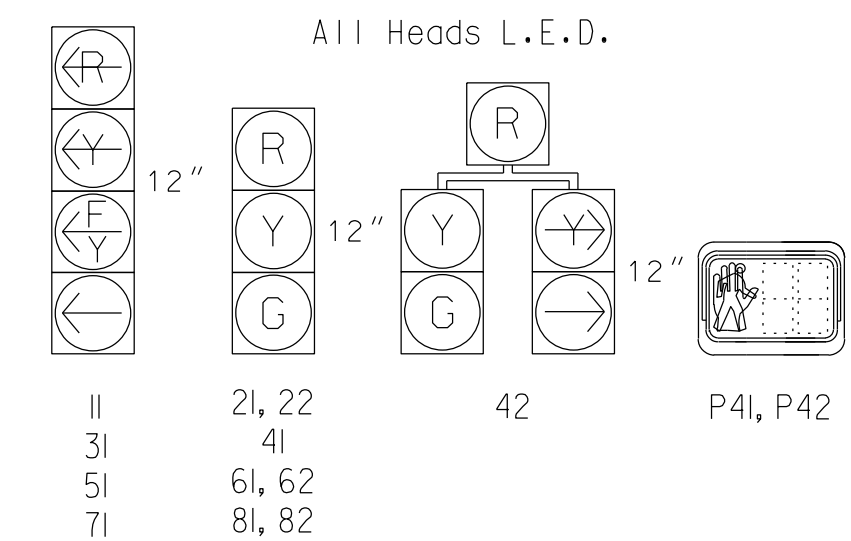
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	STRETCH TIME		
1A	6X40	0	2-4-2	-	1	Y	Y	-	15*	-
2A	6X6	70	4	Y	2	Y	Y	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	15*	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	15*	-
5B	6X40	0	2-4-2	-	5	Y	Y	-	15	-
6A	6X6	70	4	-	6	Y	Y	-	-	-
7A	6X40	0	2-4-2	-	7	Y	Y	-	15*	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	10	-

- * Reduce Delay to 3 Seconds During Alternate Phasing
- ** Disable Phase Calls for Loops During Alternate Phasing

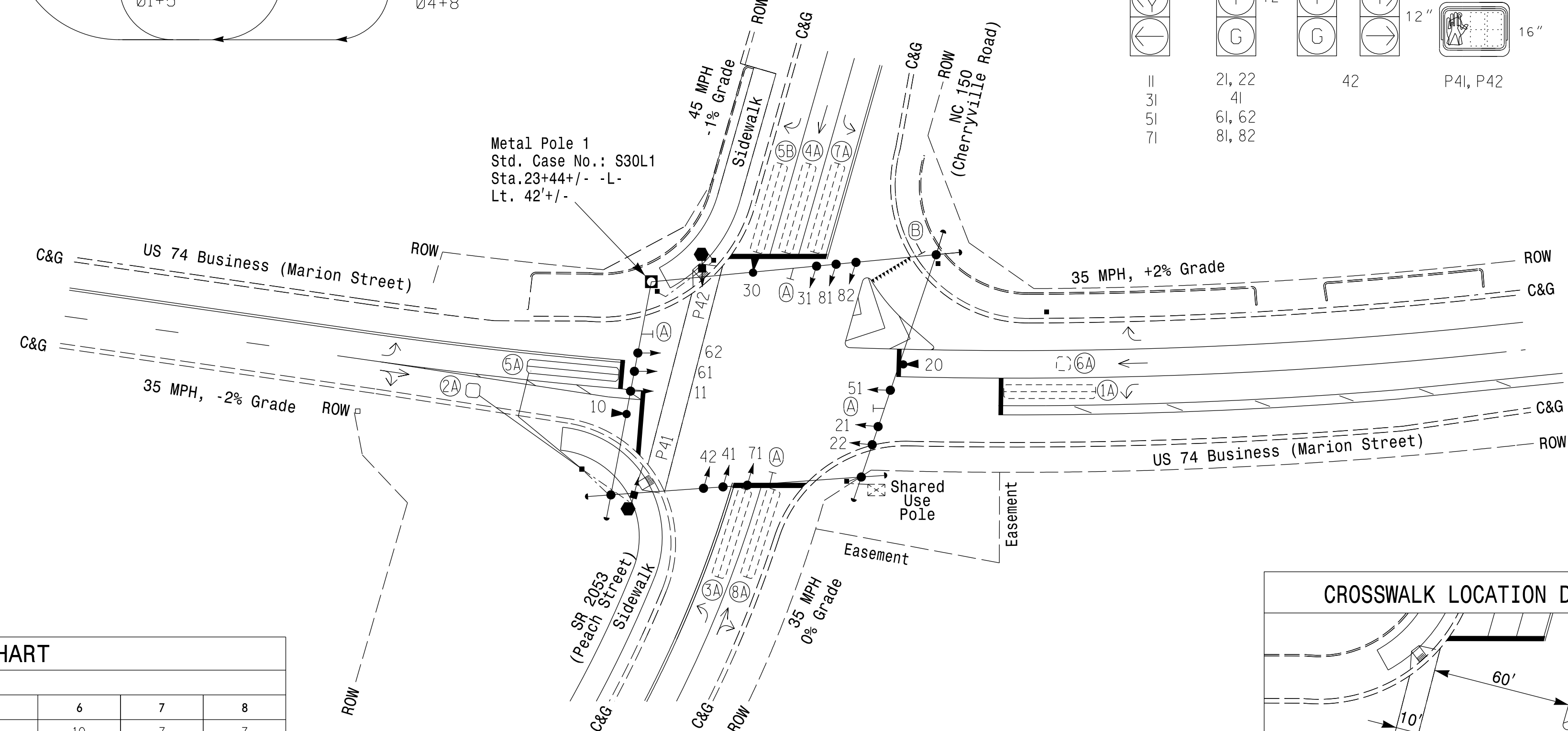
SIGNAL FACE I.D.



OASIS 2070 EV PREEMPT

FUNCTION	PRE 3	PRE 4	PRE 5
Interval 1 - Dwell Green	255	255	255
Interval 1 - Dwell Yellow	0.0*	0.0*	0.0*
Interval 1 - Dwell Red	0.0*	0.0*	0.0*
Interval 5 - Exit Green	1	1	1
Interval 5 - Yellow	0.0	0.0	0.0
Interval 5 - Red	0.0	0.0	0.0
Exit Phase(s)	2+6	2+6	4+8
Priority	Medium	Medium	Medium
Delay Time	0	0	0
Min Green Before Pre	1	1	1
Ped Clear Before Pre	11	11	11
Yellow Clear Before Pre	0.0*	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*	0.0*
Dwell Min Time	10	10	7
Enable Backup Protection	N	N	N
Ped Clear Through Yellow	Y	Y	Y
Omit Overlaps	-	-	-
Preempt Extend**	2	2	2

* Time defaults to time used for phase during normal operation
 ** Program Timing on Optical Detection Unit



LEGEND

- | PROPOSED | EXISTING |
|----------|----------|
| | |
| | |
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OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1*	7	10	7	7	7	10	7	7
Extension 1*	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max Green 1*	15	45	15	25	15	45	15	25
Yellow Clearance	3.0	4.0	3.0	4.6	3.0	4.0	3.0	4.6
Red Clearance	3.5	2.8	2.1	1.3	2.9	2.8	2.4	1.3
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1*	-	-	-	7	-	-	-	-
Don't Walk 1	-	-	-	22	-	-	-	-
Walk Advance Time	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

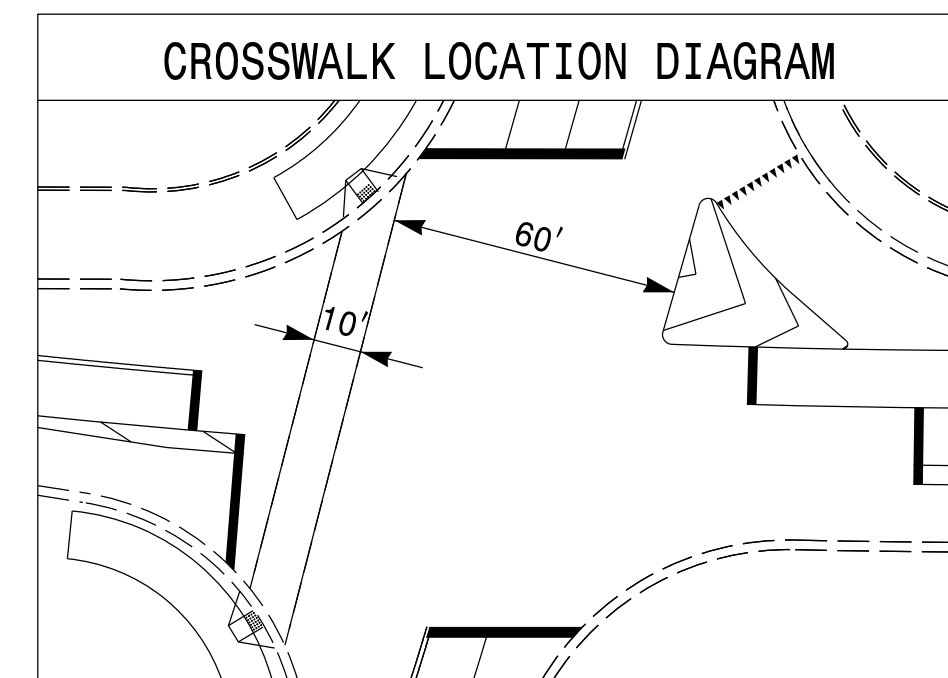
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	0	1	2	3	4	5	6	7
11	←	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41	R	R	R	R	R	G	G	R
42	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←
61, 62	R	G	R	R	R	R	R	Y
71	←	←	←	←	←	←	←	←
81, 82	R	R	R	R	R	G	G	R
P41, P42	DW	DW	DW	DW	DW	W	W	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	0	1	2	3	4	5	6	7
11	←	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41	R	R	R	R	R	G	G	R
42	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←
61, 62	R	G	R	R	R	R	R	Y
71	←	←	←	←	←	←	←	←
81, 82	R	R	R	R	R	G	G	R
P41, P42	DW	DW	DW	DW	DW	W	W	DRK



This plan supersedes the plan signed and sealed on 11/13/2018.

Signal Upgrade-Final Design

US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis

PREPARED BY: J. Ma REVIEWED BY: M.L. Stygles

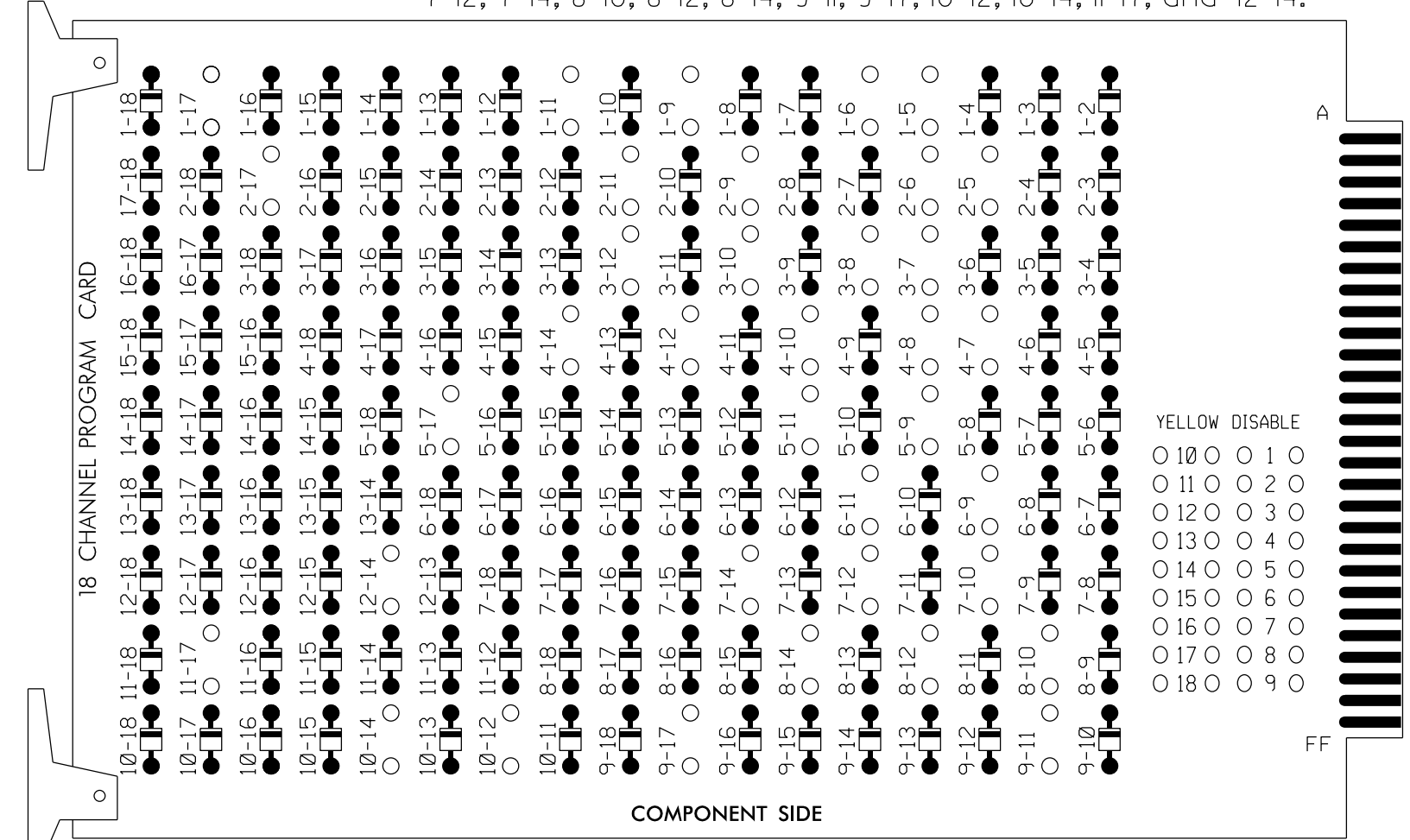
REVISIONS: INIT. DATE

SEAL: J. Ma 3/1/2022

SIG. INVENTORY NO. 12-0600

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)
 REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-17, 2-5, 2-6, 2-9, 2-11, 2-17, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 4-14, 5-9, 5-11, 5-17, 6-9, 6-11, 7-10, 7-12, 7-14, 8-10, 8-12, 8-14, 9-11, 9-17, 10-12, 10-14, 11-17, and 12-14.



REMOVE JUMPERS AS SHOWN

- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 for Startup In Green.
- Program phase 4 for Startup Ped Call.
- Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S7,S8,S10,S11,
 AUX S1,AUX S2,AUX S3, AUX S4,AUX S5
 PHASES USED.....1,2,3,4,4 PED,5,6,7,8
 OVERLAP "A".....1+2
 OVERLAP "B".....3+4
 OVERLAP "C".....5+6
 OVERLAP "D".....7+8
 OVERLAP "E".....5

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	OLE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	41,42	P41, P42	51	61,62	NU	71	81,82	NU	11	31	42	51	71	NU
RED		128		101				134			107					*		
YELLOW	*	129		102			*	135		*	108							
GREEN		130		103				136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125	A112	A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127			118				133			124					A113		
Hand								104										
Person								106										

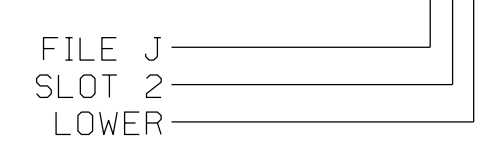
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail this sheet.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10★	26	6	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
	TB4-5,6	I5U	58	20	3	3	Y	Y			15
3A ²	-	J8U	50	12★	28	8	Y	Y			3
	-	I5U	58	20★	53	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
	TB3-1,2	J1U	55	17	5	5	Y	Y			15
5A ³	-	I4U	47	9★	22	2	Y	Y			
	-	J1U	55	17★	55	5	Y	Y			
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
	TB3-5,6	J2U	40	2	6	6	Y	Y			
7A ⁴	TB5-5,6	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11★	24	4	Y	Y			3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

- NOTE:
 INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.
- Add jumper from I1-W to J4-W, on rear of input file.
 - Add jumper from I5-W to J8-W, on rear of input file.
 - Add jumper from J1-W to I4-W, on rear of input file.
 - Add jumper from J5-W to I8-W, on rear of input file.
- ★ See Input Page Assignment programming details on sheets 3, 4, 5, and 6.

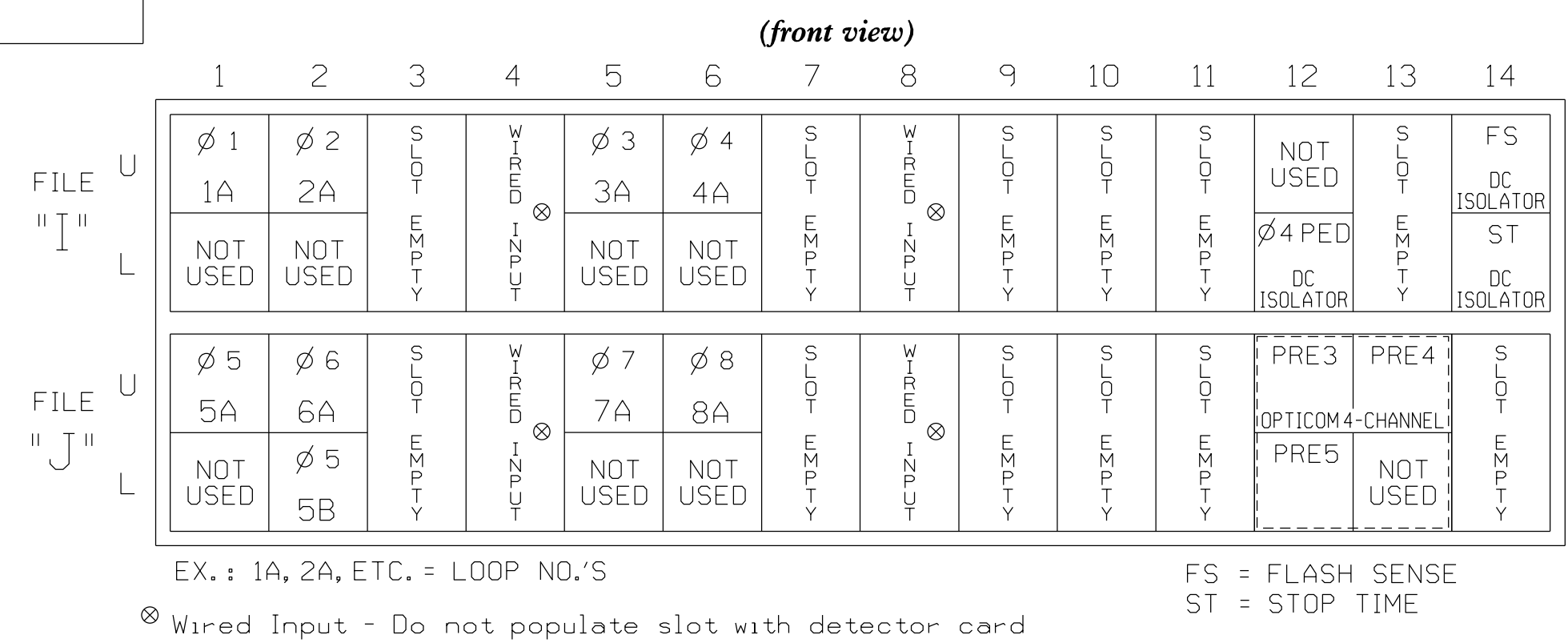
INPUT FILE POSITION LEGEND: J2L



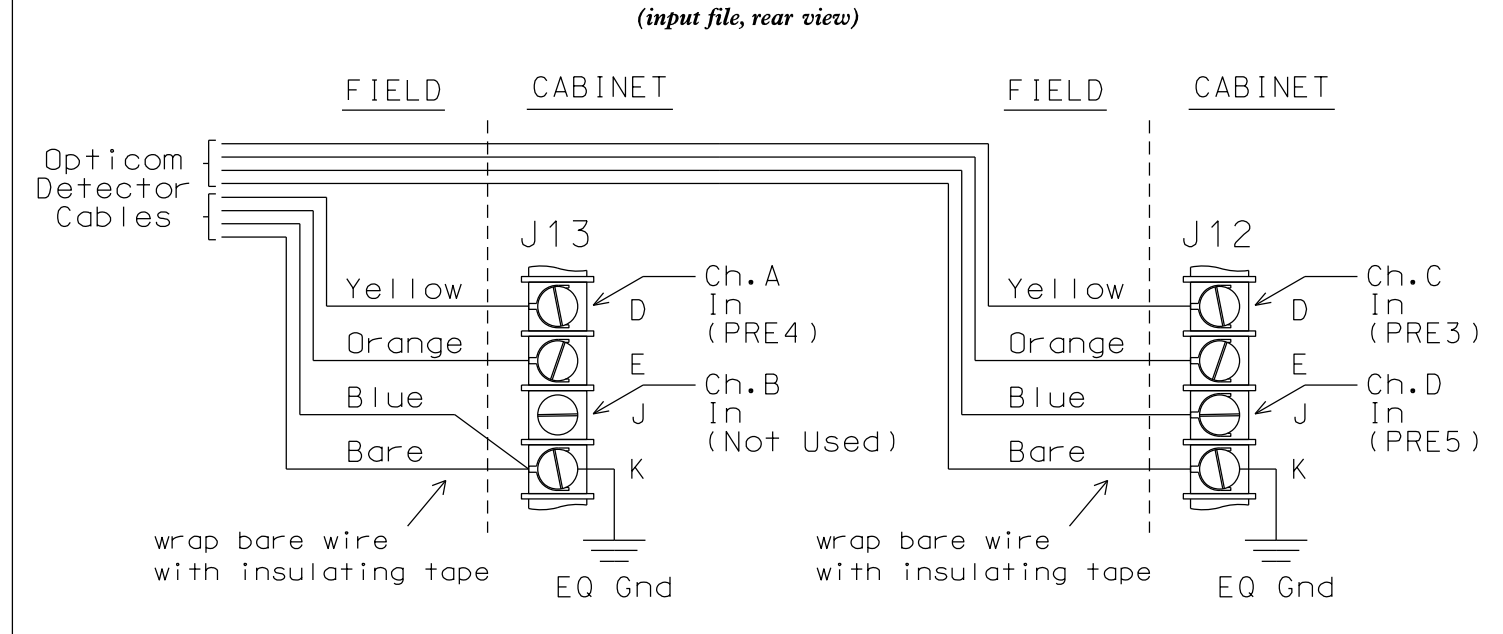
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

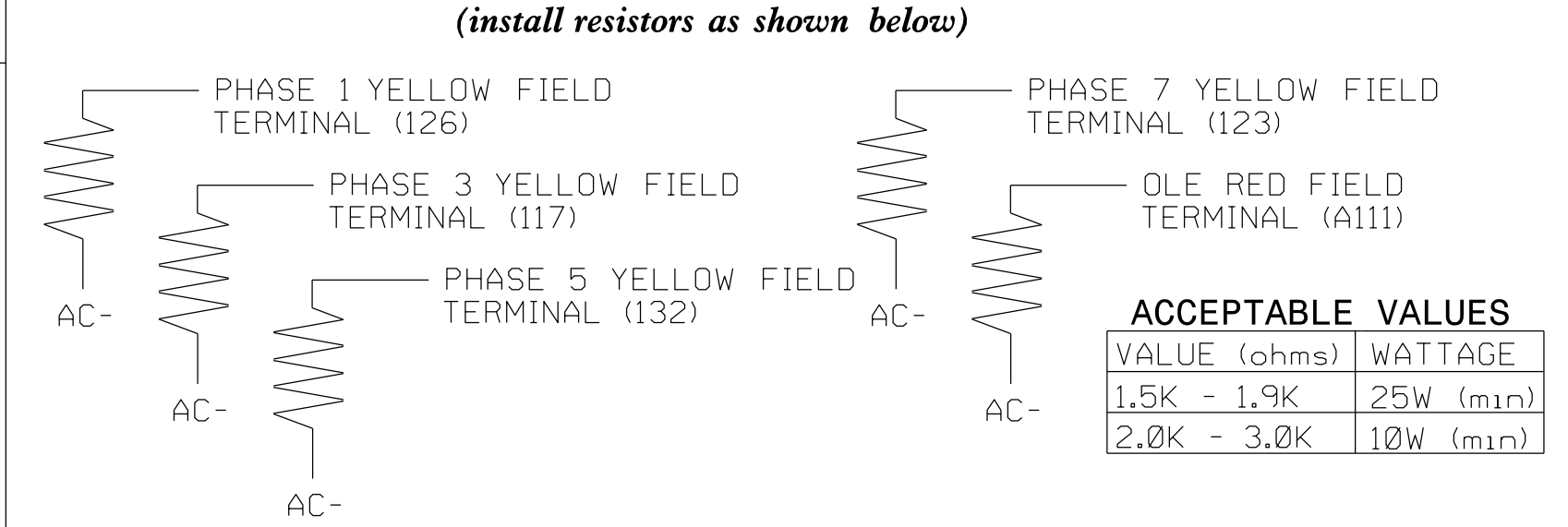
INPUT FILE POSITION LAYOUT



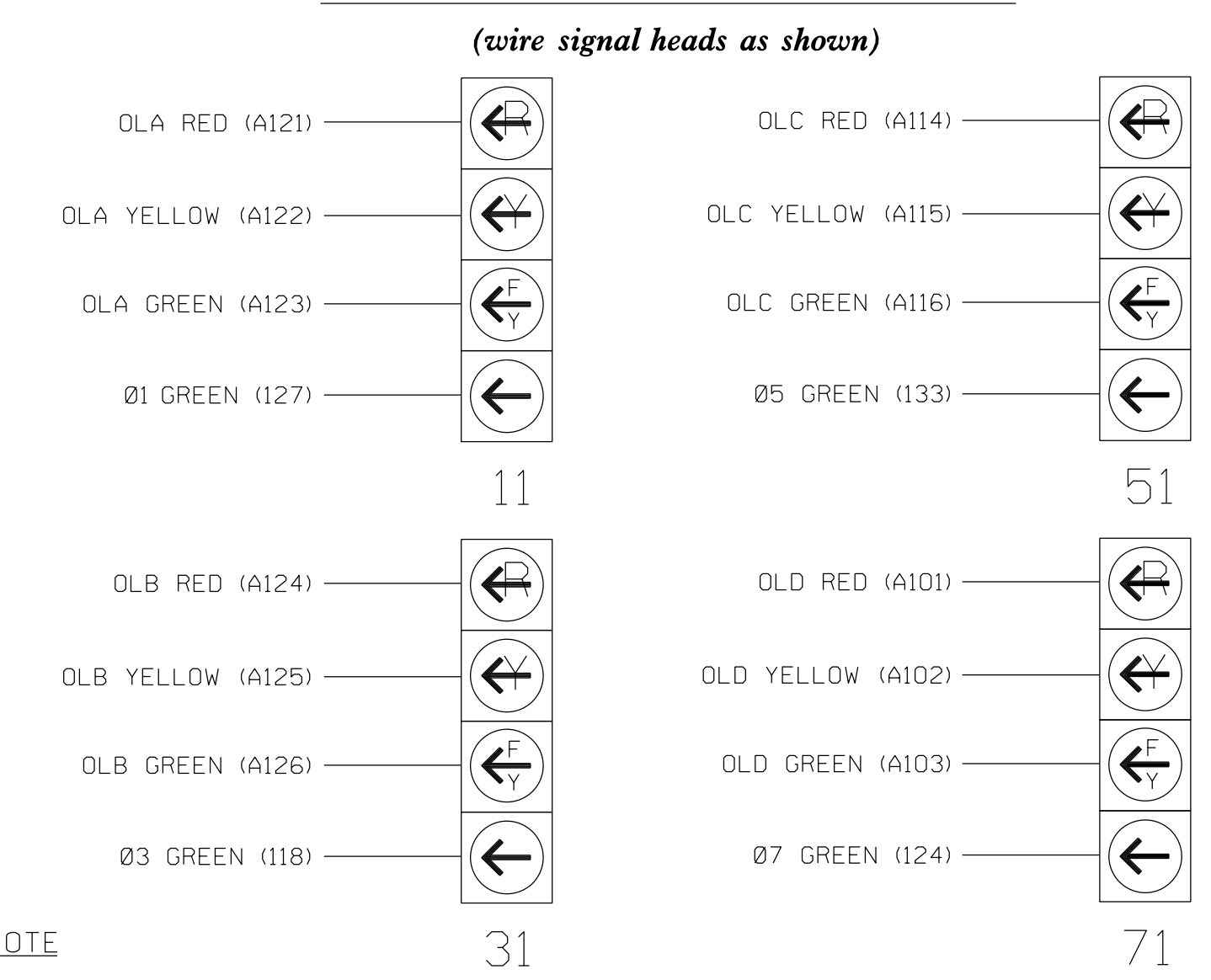
TYPICAL OPTICOM FIELD WIRE DETAIL



LOAD RESISTOR INSTALLATION DETAIL



FYA SIGNAL WIRING DETAIL



NOTE
 The sequence display for signal heads 11, 31, 51, and 71 requires special logic programming. See sheet 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600
 DESIGNED: March 2022
 SEALED: 03/01/2022
 REVISED: N/A

This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail-Final Design-Sheet 1 of 9

Prepared for the Offices of:

 US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)
 Division 12 Cleveland County Shelby
 PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis
 PREPARED BY: J. Ma REVIEWED BY: M.L. Stygles
 REVISIONS: INIT. DATE
 750 N. Greenfield Pkwy, Garner, NC 27529

 VHB Engineering NC, P.C. (C-3705)
 940 Main Campus Drive, Suite 500
 Raleigh, NC 27607
 P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 033108
 J. L. Lewis
 3/1/2022
 DATE
 SIG. INVENTORY NO. 12-0600

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

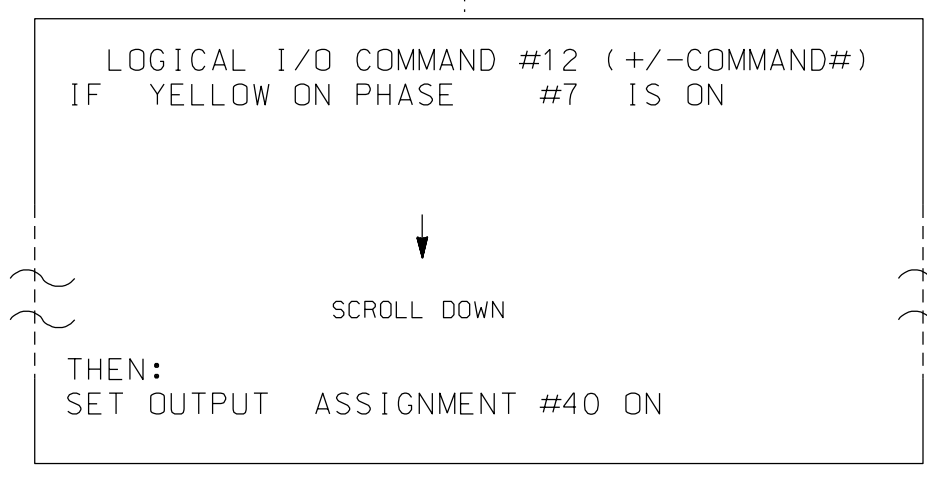
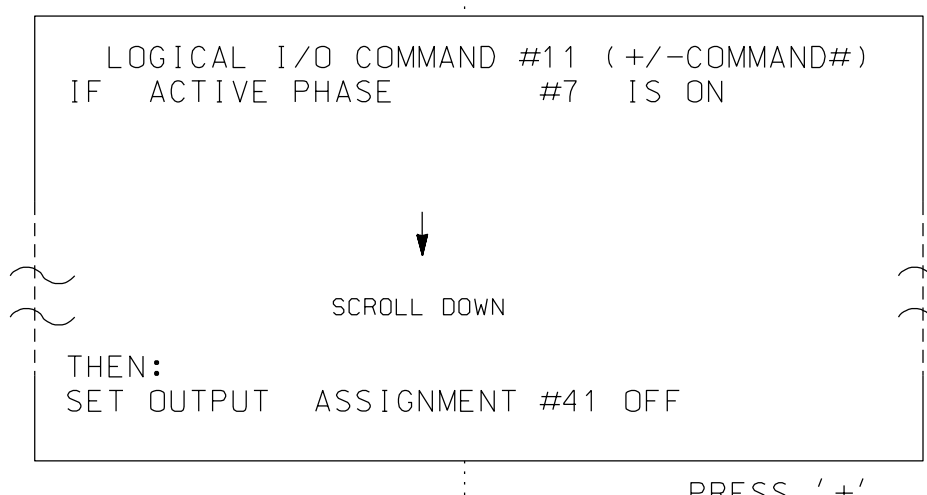
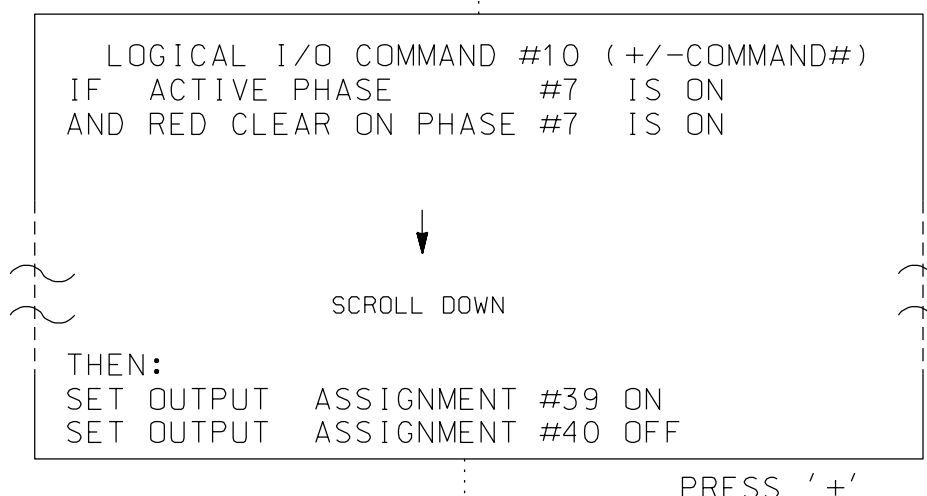
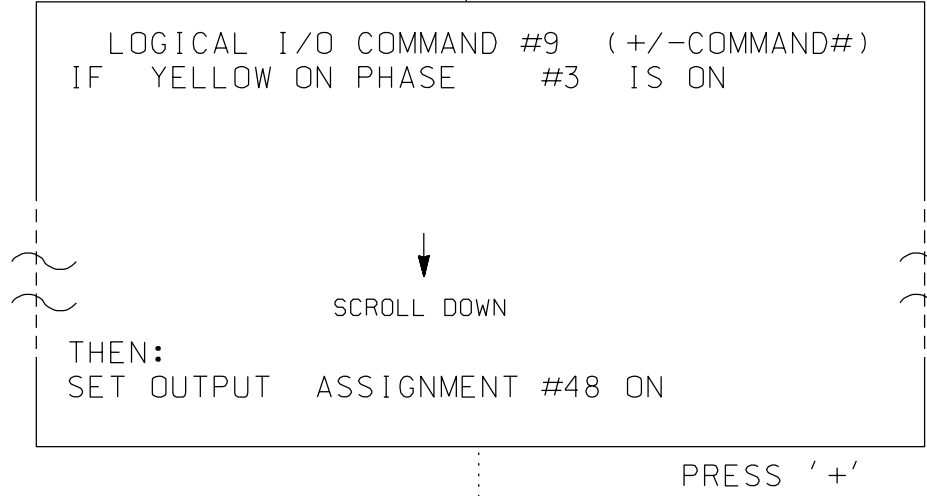
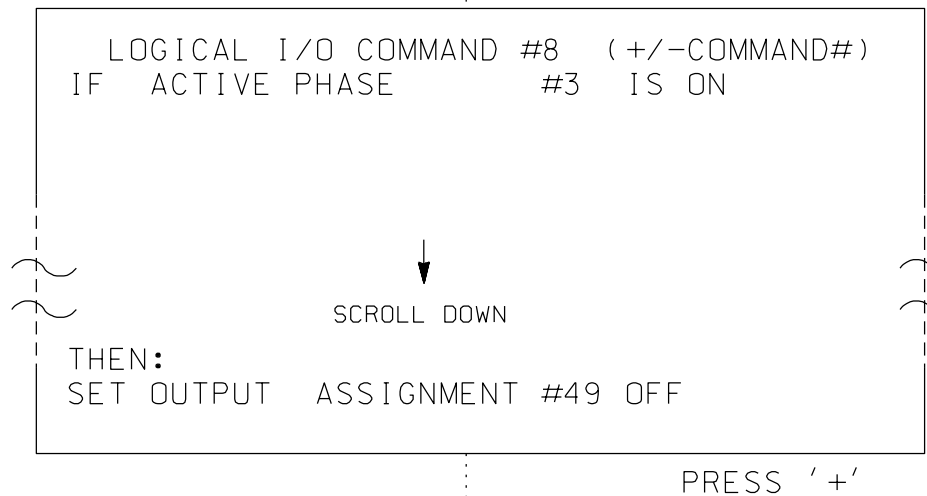
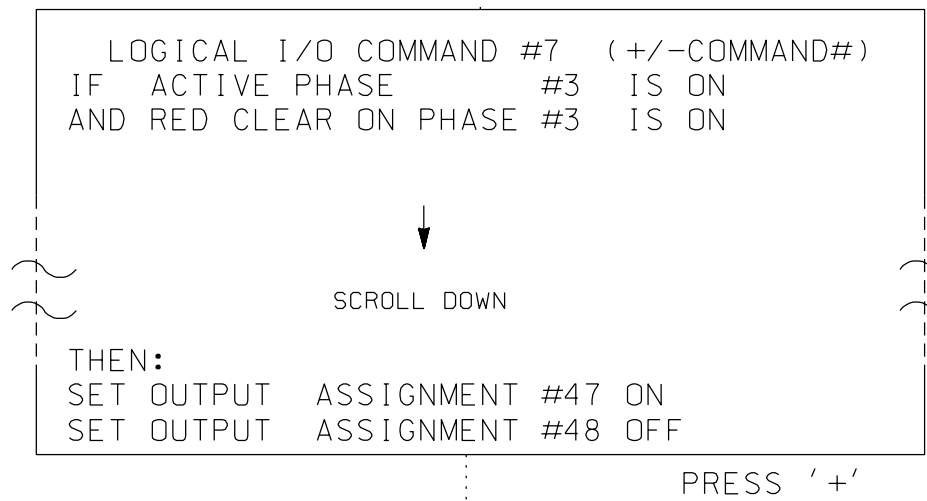
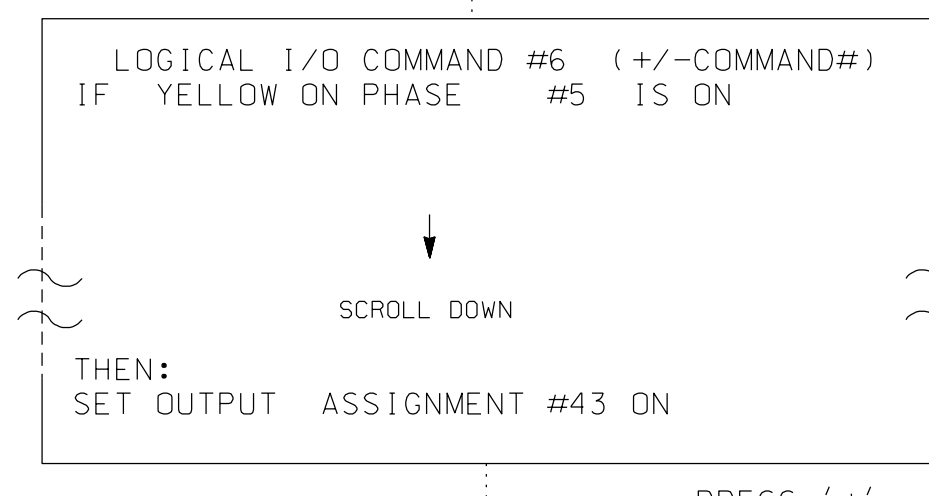
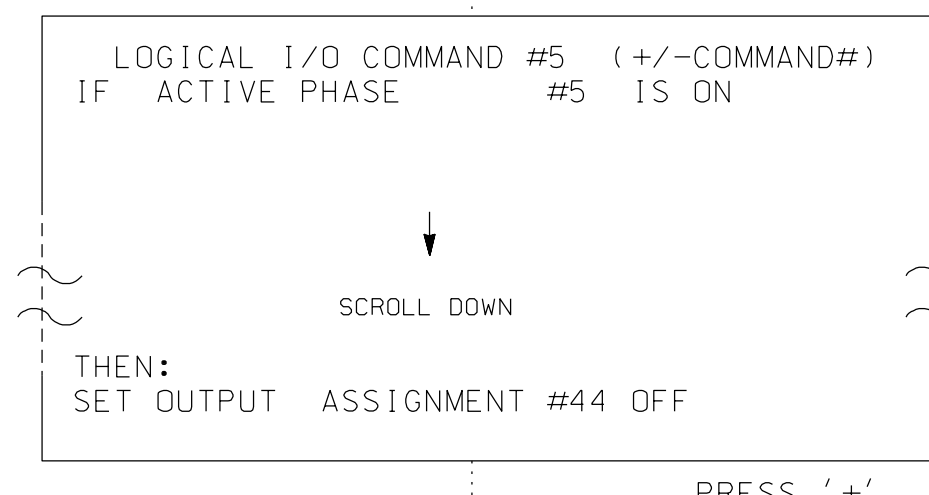
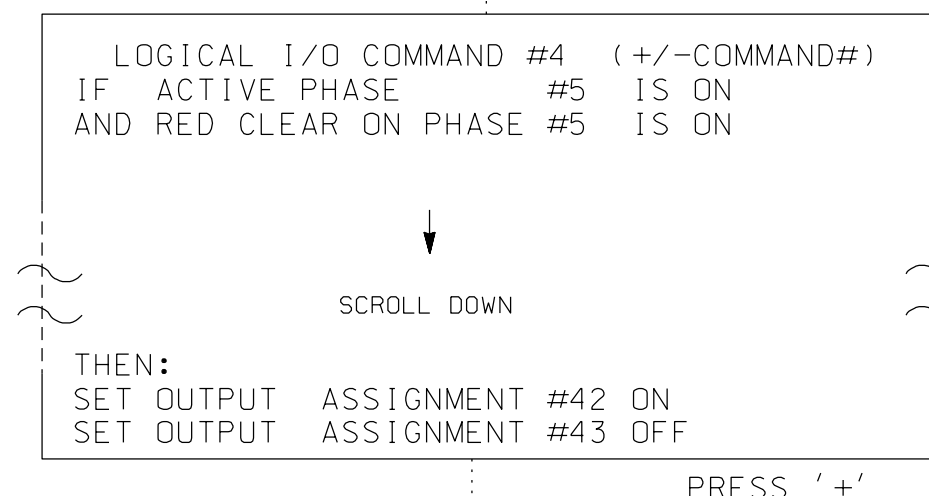
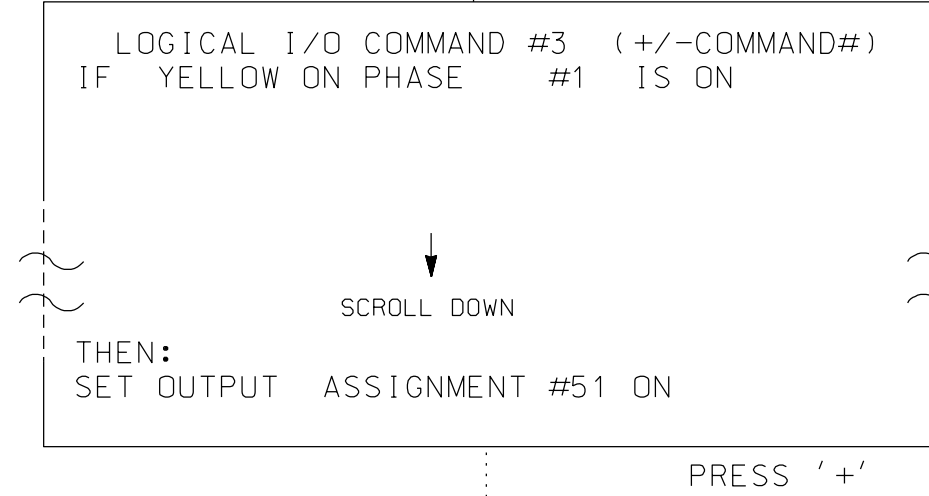
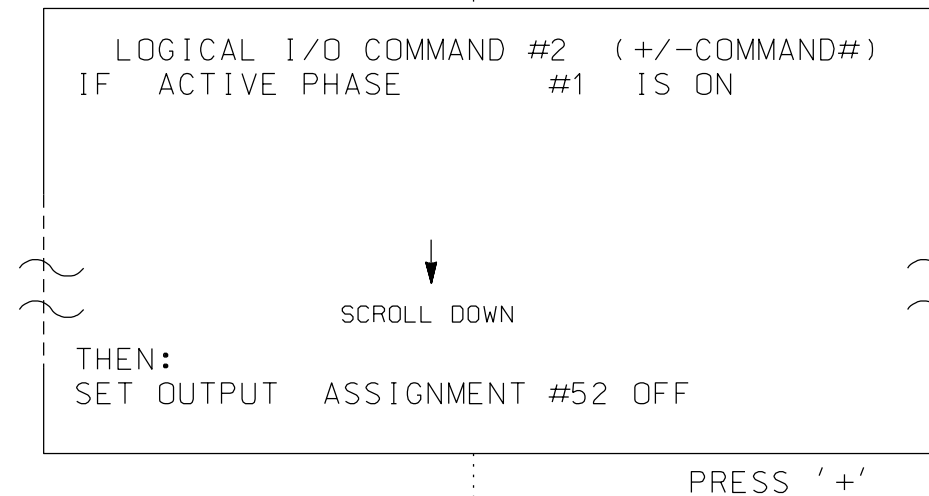
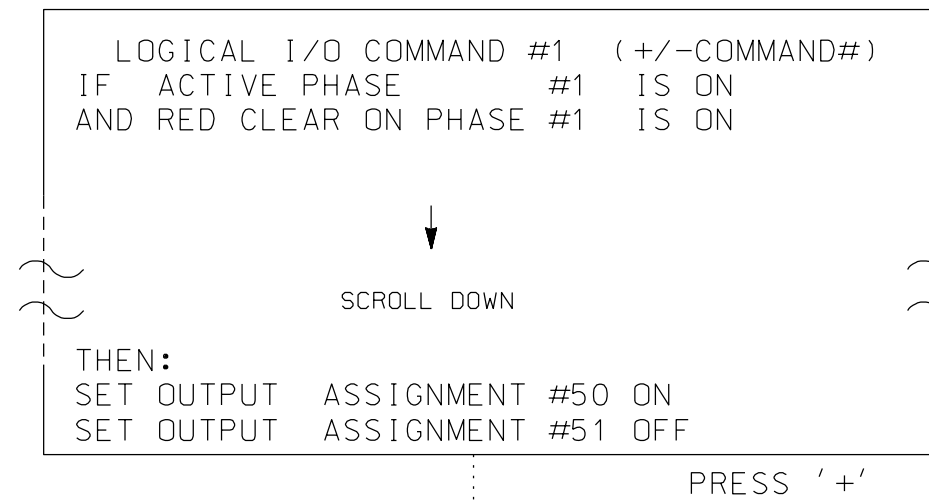
(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, AND 12.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 39 = Overlap D Red
 OUTPUT 40 = Overlap D Yellow
 OUTPUT 41 = Overlap D Green
 OUTPUT 42 = Overlap C Red
 OUTPUT 43 = Overlap C Yellow
 OUTPUT 44 = Overlap C Green
 OUTPUT 47 = Overlap B Red
 OUTPUT 48 = Overlap B Yellow
 OUTPUT 49 = Overlap B Green
 OUTPUT 50 = Overlap A Red
 OUTPUT 51 = Overlap A Yellow
 OUTPUT 52 = Overlap A Green

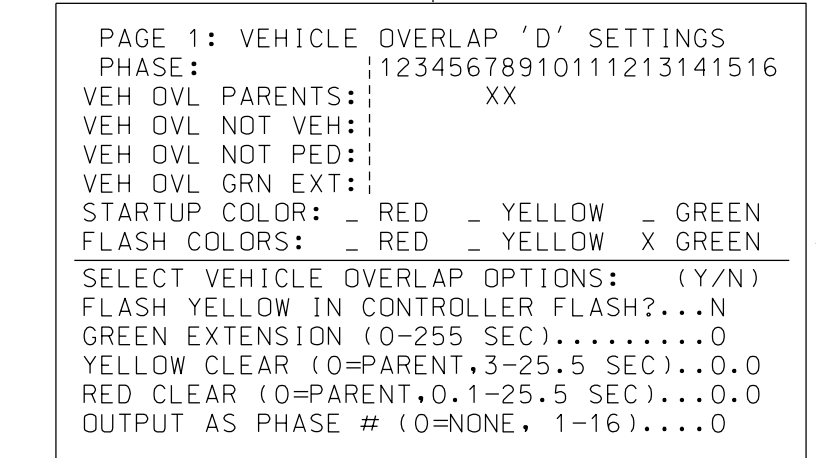
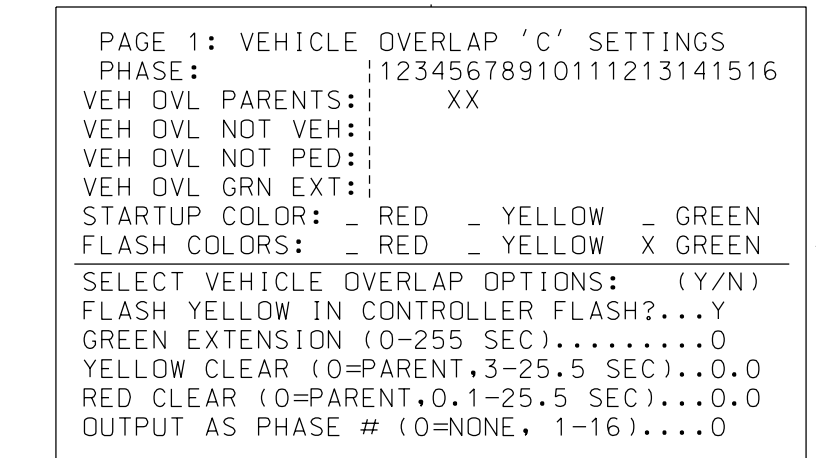
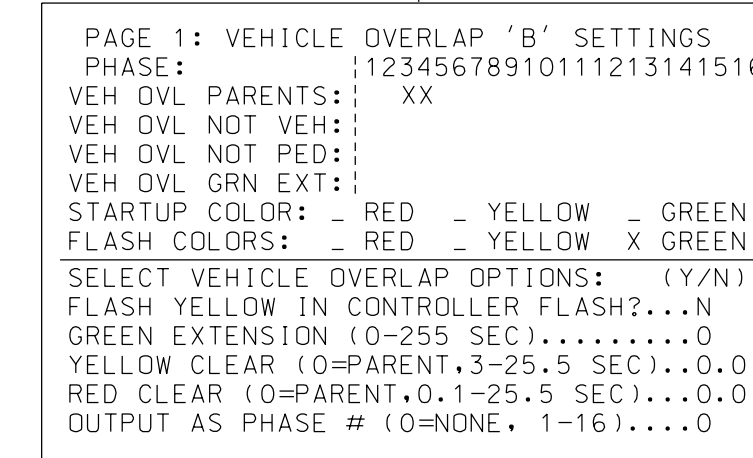
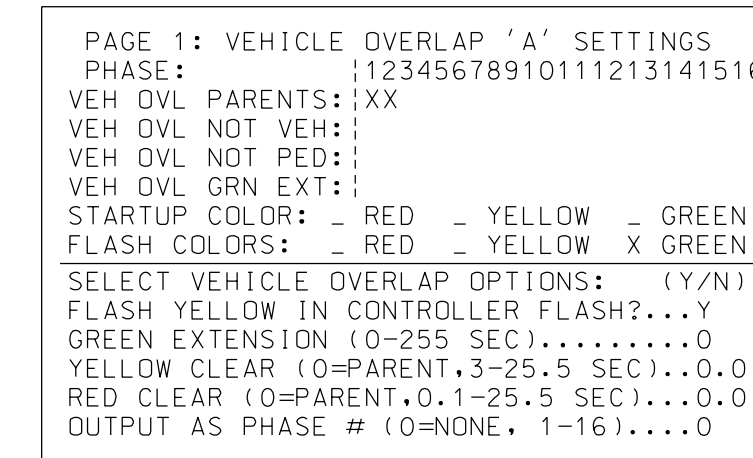


LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

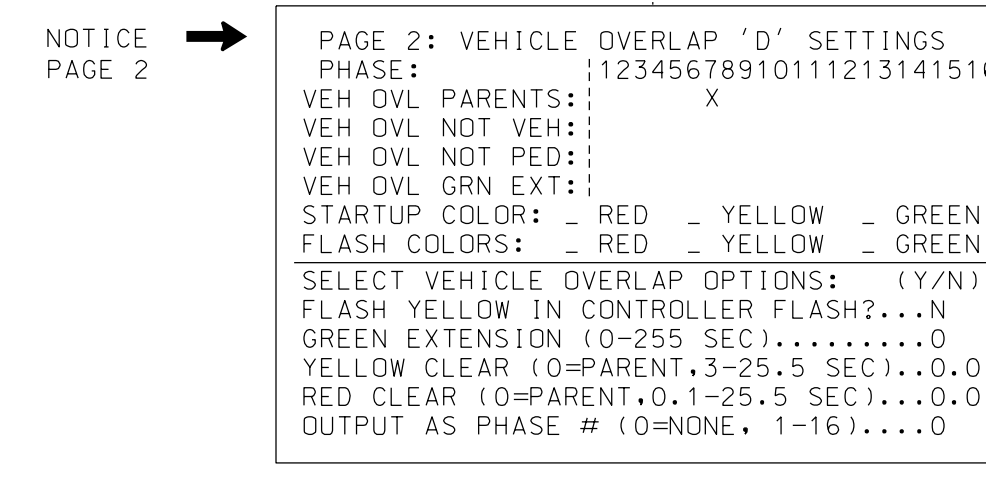
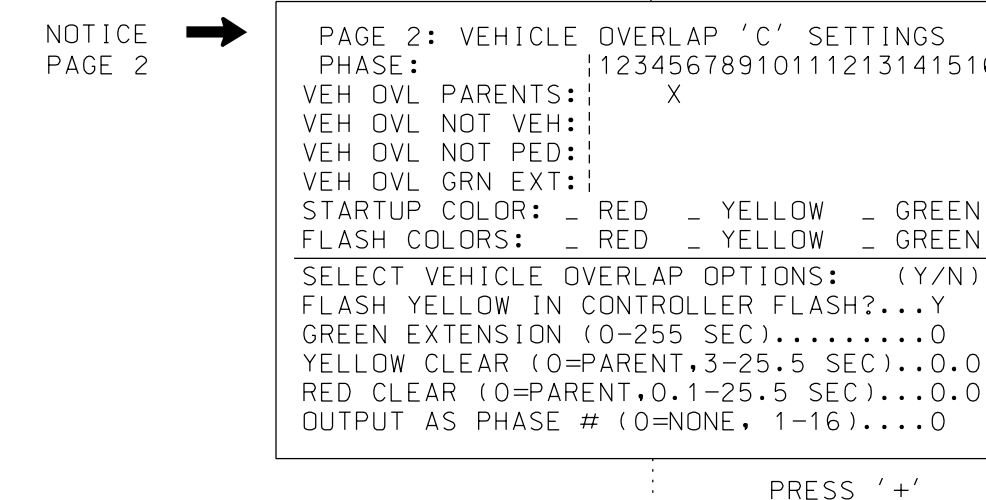
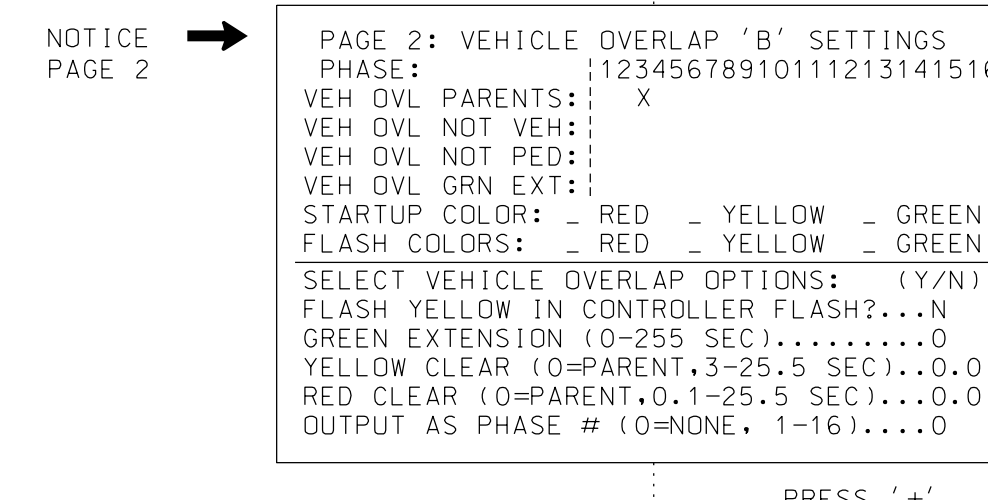
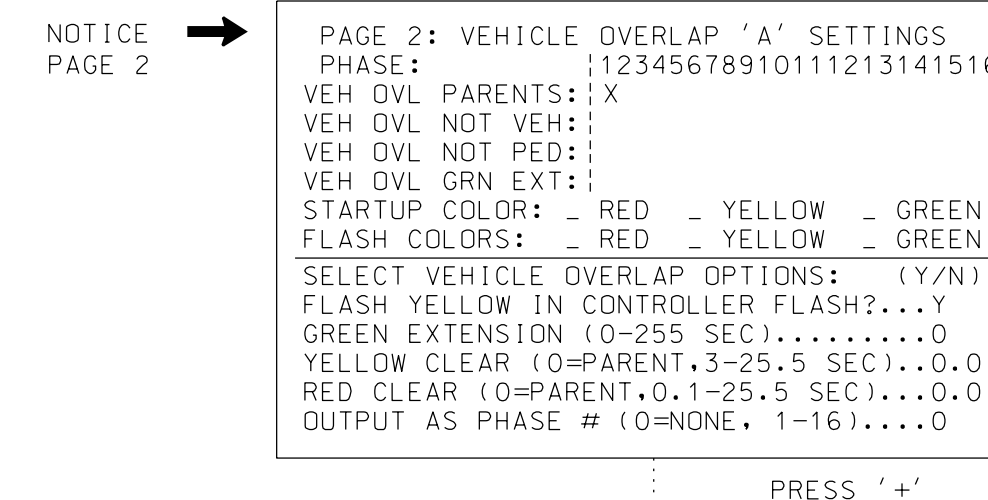


OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

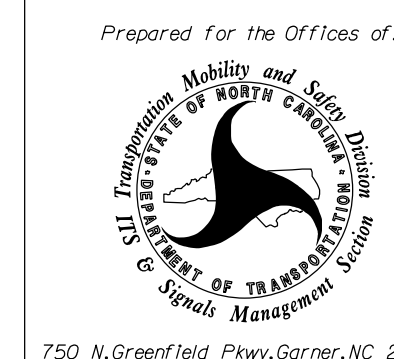


OVERLAP PROGRAMMING COMPLETE

This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail-Final Design-Sheet 2 of 9

ELECTRICAL AND PROGRAMMING DETAILS FOR:



US 74 Bus. (Marion Street)
 at
 NC 150 (Cherryville Road) /
 SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis

PREPARED BY: J. Ma REVIEWED BY: M.L. Styles

REVISIONS INIT. DATE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600
 DESIGNED: March 2022
 SEALED: 03/01/2022
 REVISED: N/A



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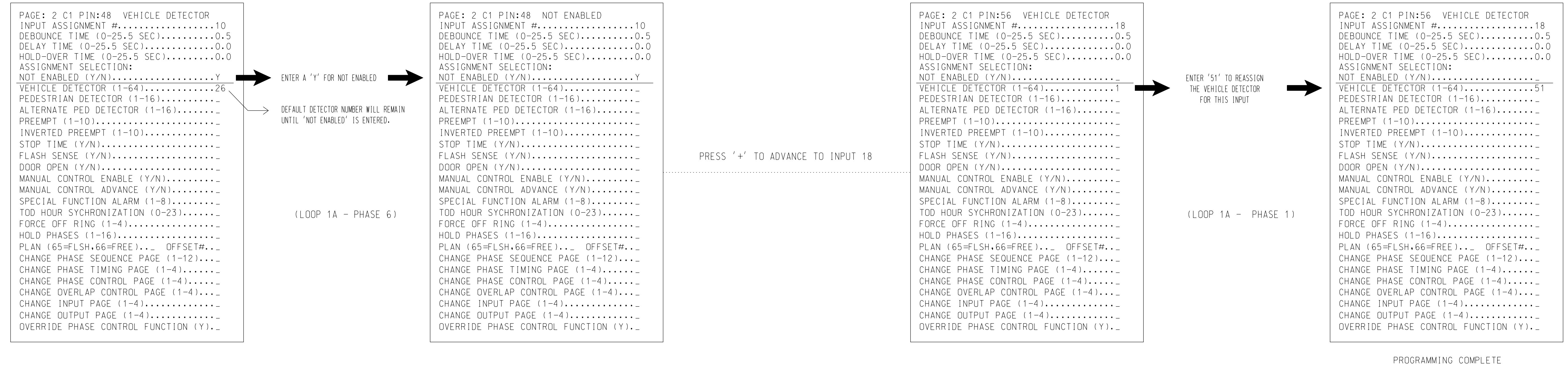
SIG. INVENTORY NO. 12-0600

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

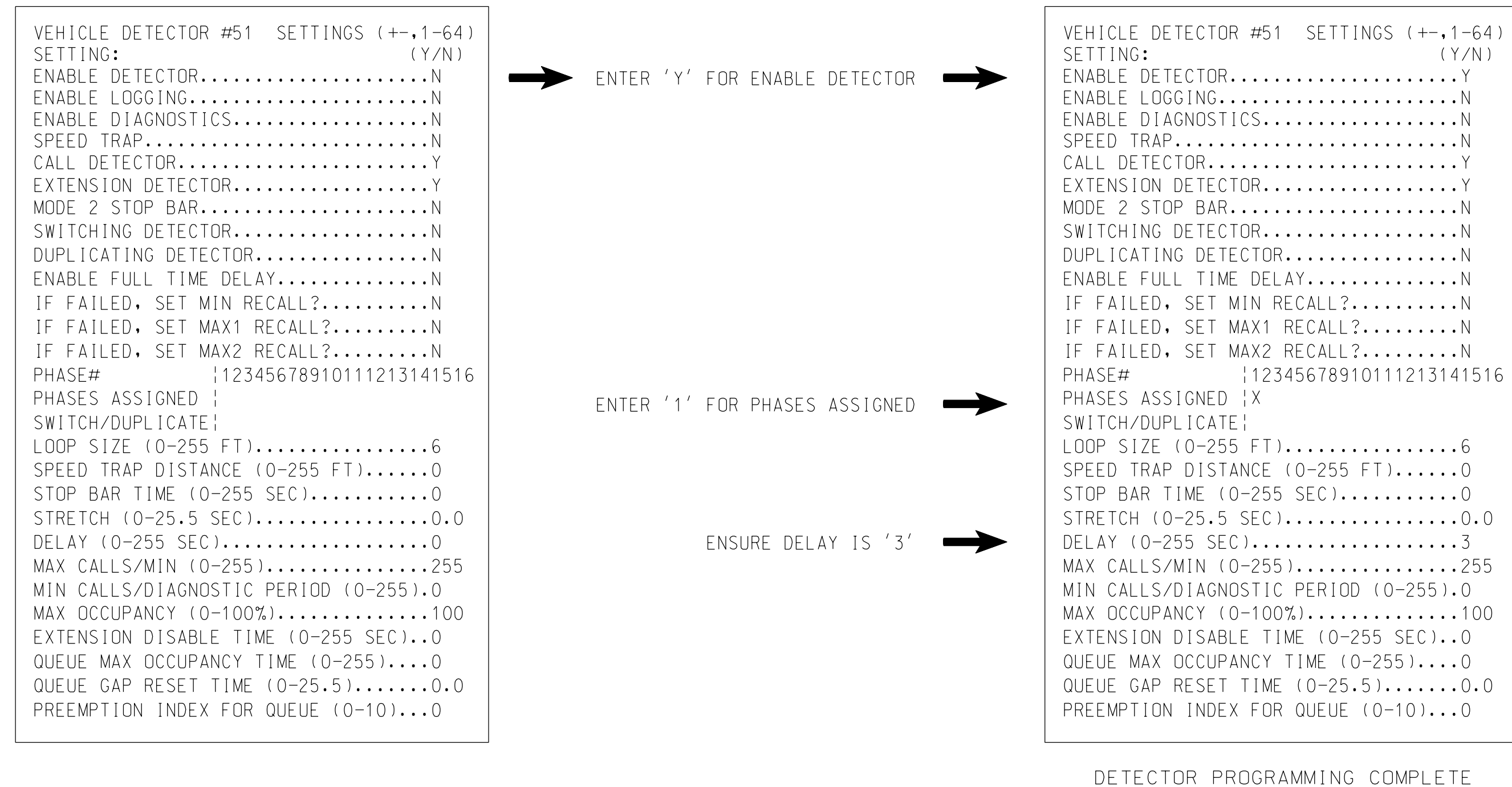
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600
 DESIGNED: March 2022
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 REVISED: N/A

This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail-Final Design-Sheet 3 of 9

US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis
 PREPARED BY: J. Ma REVIEWED BY: M.L. Stygles

REVISIONS	INIT.	DATE

750 N. Greenfield Pkwy, Garner, NC 27529



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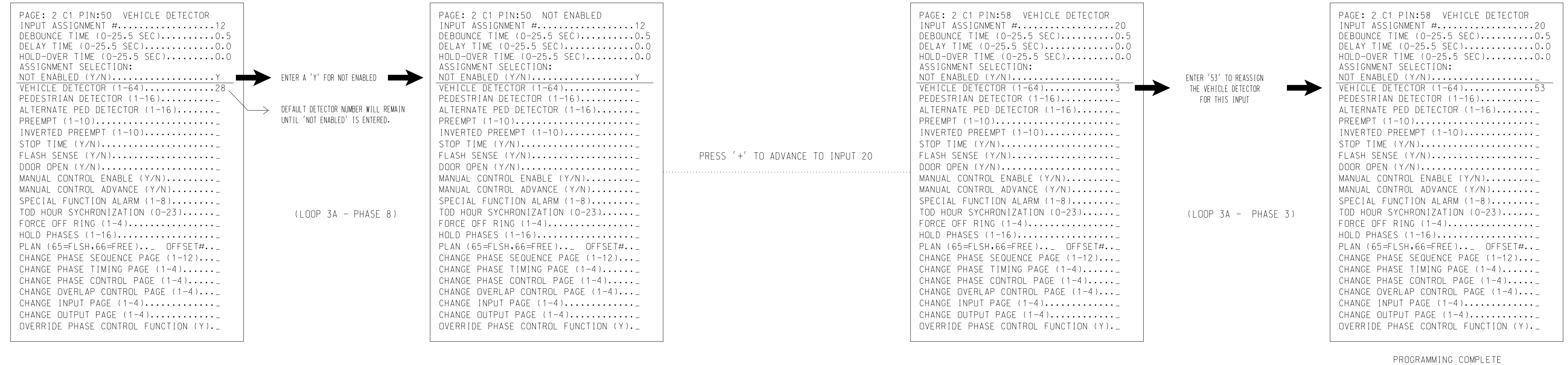
SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEERS
 SEAL 033108
 JIANXIN MA
 3/1/2022
 DATE
 SIG. INVENTORY NO. 12-0600

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 3A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #12 (DETECTOR 28) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 8 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 53 TO INPUT #20 SO THAT THE DELAY ON LOOP 3A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

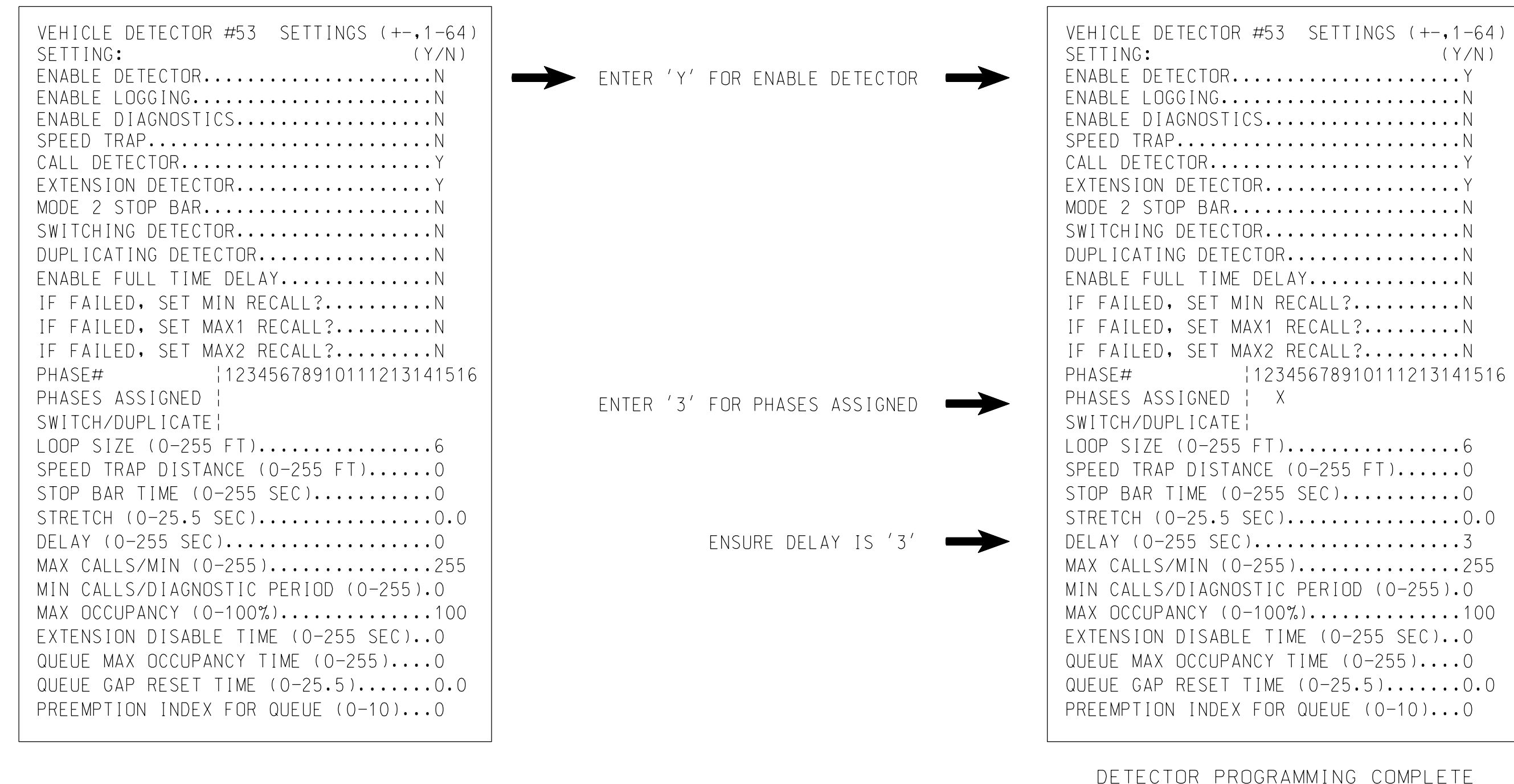
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 12 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 3A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #53.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600
 DESIGNED: March 2022
 SEALED: 03/01/2022
 REVISED: N/A

This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail-Final Design-Sheet 4 of 9

ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)	
Prepared for the Offices of:		Division 12 Cleveland County Shelby	
PLAN DATE: March 2022	REVIEWED BY: J.L. Lewis	PREPARED BY: J. Ma	REVIEWED BY: M.L. Stygles
REVISIONS	INIT.	DATE	

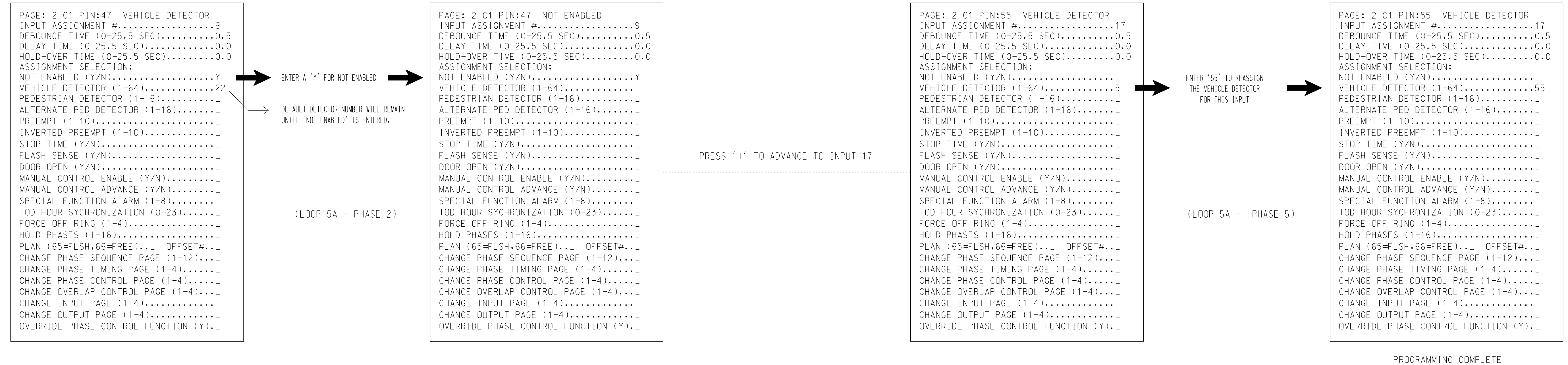
SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 J. LANXIN MA
 033108
 3/1/2022
 DATE
 SIG. INVENTORY NO. 12-0600

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

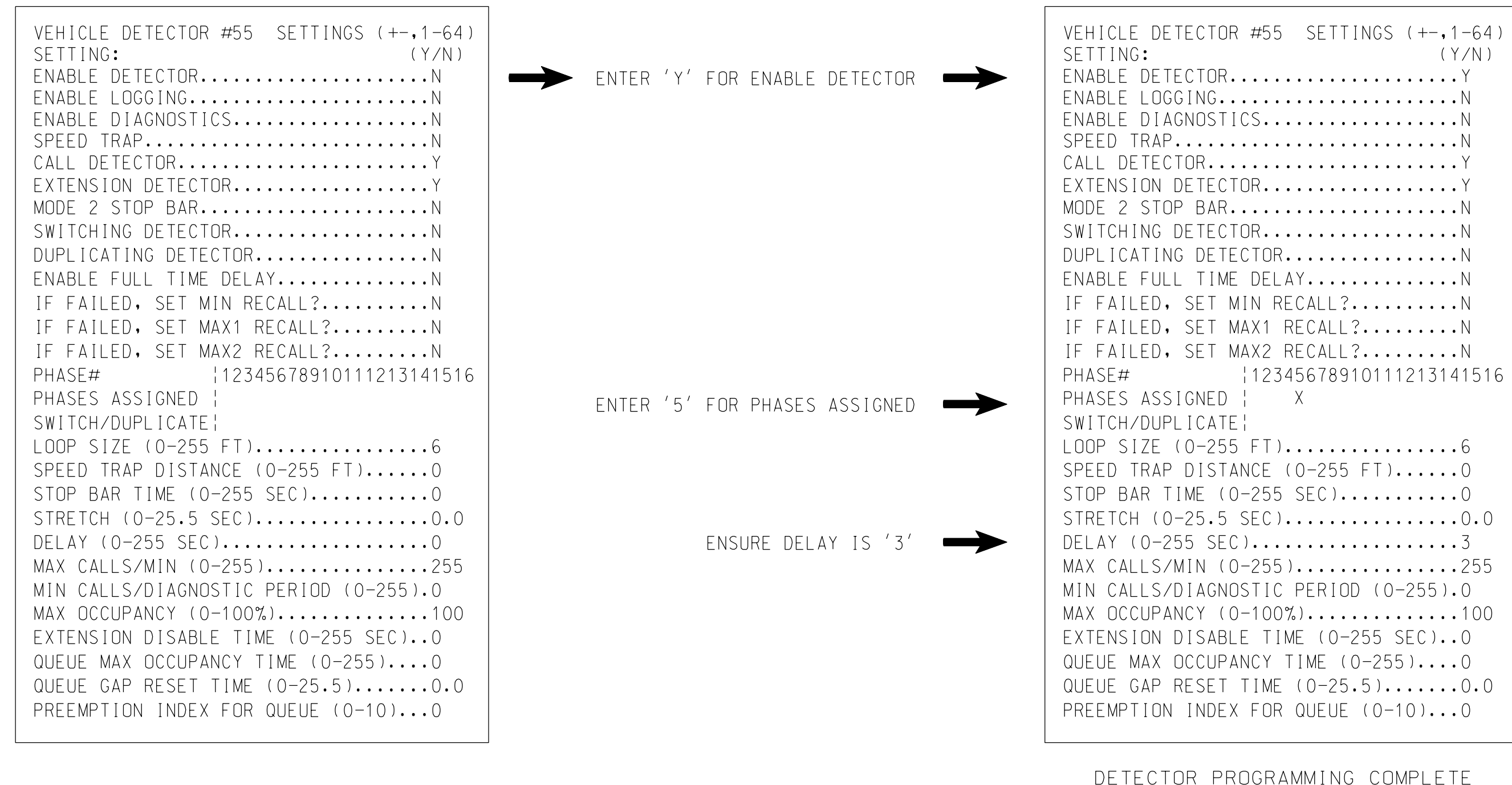
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600
 DESIGNED: March 2022
 SEALED: 03/01/2022
 REVISED: N/A

This plan supersedes the plan signed and sealed on 11/13/2018.

Electrical Detail-Final Design-Sheet 5 of 9

US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis
 PREPARED BY: J. Ma REVIEWED BY: M.L. Stygles

REVISIONS	INIT.	DATE

750 N. Greenfield Pkwy, Garner, NC 27529



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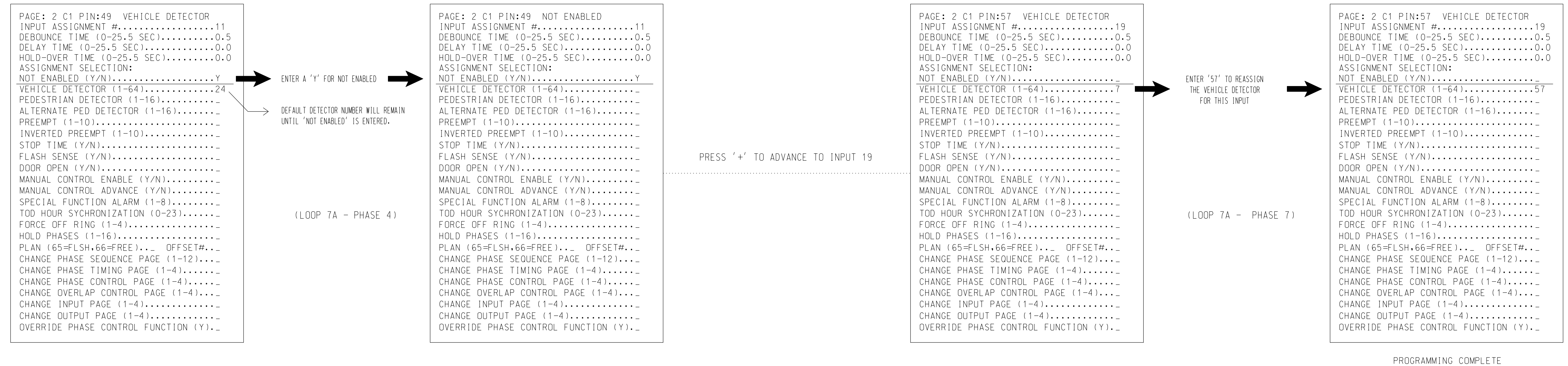
SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 033108
 J. L. Lewis
 3/1/2022
 DATE
 SIG. INVENTORY NO. 12-0600

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 7A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #11 (DETECTOR 24) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 4 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 57 TO INPUT #19 SO THAT THE DELAY ON LOOP 7A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

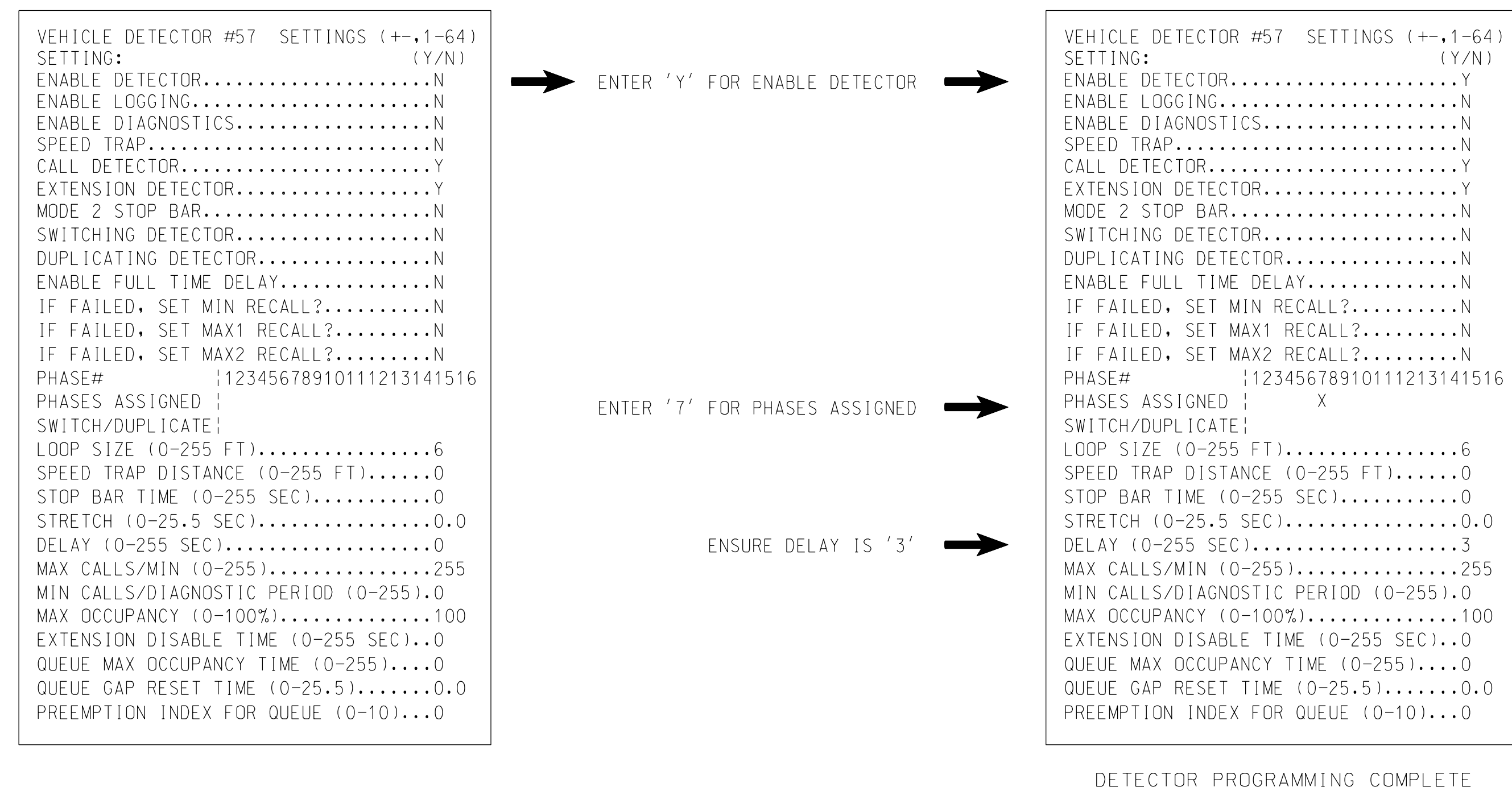
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 11 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 7A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #57.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

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Electrical Detail-Final Design-Sheet 6 of 9

	Prepared for the Offices of: Mobility and Safety Division Signal Management Section 750 N. Greenfield Pkwy, Garner, NC 27529		US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)
	Division 12 PLAN DATE: March 2022 PREPARED BY: J. Ma	Cleveland County REVIEWED BY: J.L. Lewis REVIEWED BY: M.L. Stygles	Shelby SEAL 033108 J. L. Lewis M. L. Stygles DATE: 3/1/2022

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

<u>PHASING</u>	<u>INPUTS PAGE</u>	<u>OVERLAPS PAGE</u>
ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u>	1	1
ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u>	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11, 31, 51, and 71 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

Disables phase 8 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 3 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

Disables phase 4 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 3 seconds.

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO ENSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

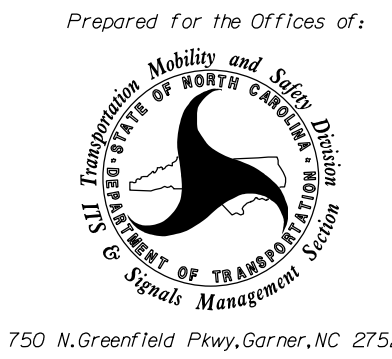
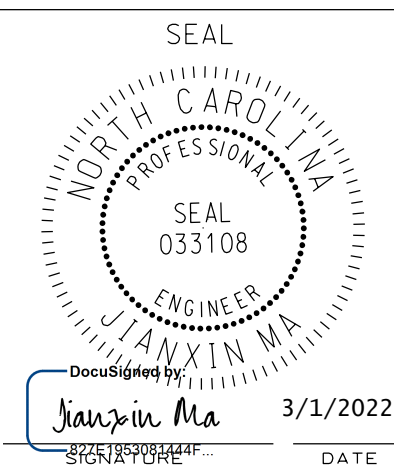
1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0600
DESIGNED: March 2022
SEALED: 03/01/2022
REVISED: N/A

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Electrical Detail-Final Design-Sheet 7 of 9

 <small>750 N. Greenfield Pkwy, Garner, NC 27529</small>	US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)	 <small>SEAL 033108 J. L. LEWIS PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA</small>
	Division 12 Cleveland County Shelby	
REVISIONS INIT. DATE		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL DATE: 3/1/2022 SIG. INVENTORY NO. 12-0600



EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' as needed to advance to Preempts 3, 4 and 5.

PREEMPTION #3	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 255 0.0 0.0	X X
2 0 0.0 0.0	
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	MED
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	11
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	0.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	0.0
DWELL MIN TIMER (0-255 SEC)	10
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY?	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	Y
INHIBIT OVERLAP GREEN EXTENSION?	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL?	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	X

PRESS 'NEXT'

Program extend time on optical detector unit for 2.0 seconds.

PREEMPTION #4	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 255 0.0 0.0	X X
2 0 0.0 0.0	
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	MED
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	11
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	0.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	0.0
DWELL MIN TIMER (0-255 SEC)	10
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY?	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	Y
INHIBIT OVERLAP GREEN EXTENSION?	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL?	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	

PRESS 'NEXT'

PREEMPTION #5	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 255 0.0 0.0	X X
2 0 0.0 0.0	
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X

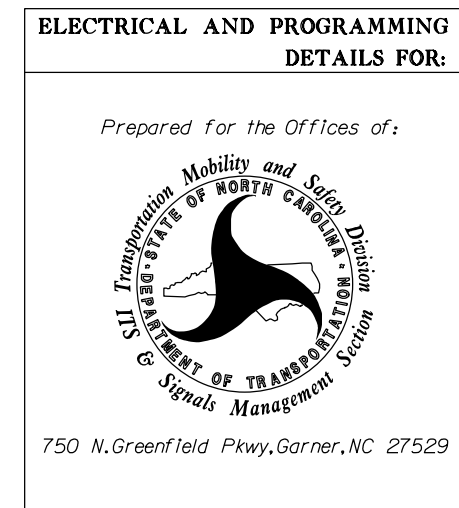
EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	MED
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	11
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	0.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	0.0
DWELL MIN TIMER (0-255 SEC)	7
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY?	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	Y
INHIBIT OVERLAP GREEN EXTENSION?	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL?	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	

PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0600
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 SEALED: 03/01/2022
 REVISED: N/A

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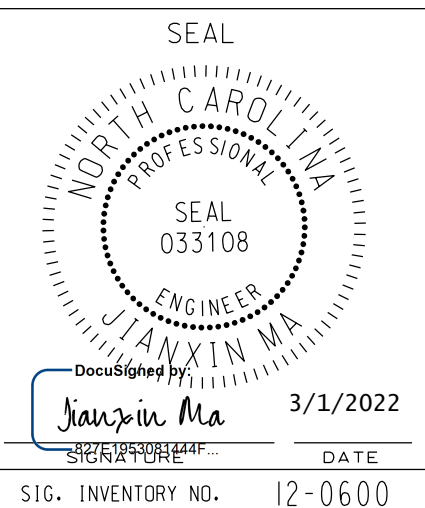
Electrical Detail-Final Design-Sheet 8 of 9



ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 74 Bus. (Marion Street) at NC 150 (Cherryville Road) / SR 2053 (Peach Street)	
Prepared for the Offices of:		Division 12	Cleveland County Shelby
PLAN DATE:	March 2022	REVIEWED BY:	J.L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M.L. Stygles
REVISIONS		INIT.	DATE



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OVERLAP "E" OUTPUT ASSIGNMENT PROGRAMMING DETAIL *(program controller as shown below)*

- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS).
- WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 45, AS SHOWN BELOW.
- PROGRAM CONTROLLER AS SHOWN:

```
PAGE:1 C1 PIN:91 NOT ENABLED
OUTPUT ASSIGNMENT #.....45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

```
PAGE:1 C1 PIN:91 NOT ENABLED
SELECT VEHICLE OVERLAP (A=1, P=16)...5
SELECT COLOR (0=RED,1=YEL,2=GRN)...0
```

WHEN A "Y" IS ENTERED FOR "VEHICLE OVERLAP" THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS ENTER AFTER ENTERING DATA, THEN ESC.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "VEHICLE OVERLAP" AS SHOWN BELOW:

```
PAGE:1 C1 PIN:91 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

VEHICLE OVERLAP E (RED) LOAD SWITCH AUX S3

- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS).
- WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 46, AS SHOWN BELOW.
- PROGRAM CONTROLLER AS SHOWN:

```
PAGE:1 C1 PIN:93 NOT ENABLED
OUTPUT ASSIGNMENT #.....46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

```
PAGE:1 C1 PIN:93 NOT ENABLED
SELECT VEHICLE OVERLAP (A=1, P=16)...5
SELECT COLOR (0=RED,1=YEL,2=GRN)...2
```

WHEN A "Y" IS ENTERED FOR "VEHICLE OVERLAP" THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS ENTER AFTER ENTERING DATA, THEN ESC.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "VEHICLE OVERLAP" AS SHOWN BELOW:

```
PAGE:1 C1 PIN:93 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

VEHICLE OVERLAP E (GREEN) LOAD SWITCH AUX S3

- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS).
- WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 54, AS SHOWN BELOW.
- PROGRAM CONTROLLER AS SHOWN:

```
PAGE:1 C1 PIN:101 CONTROLLER FLASH
OUTPUT ASSIGNMENT #.....54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

```
PAGE:1 C1 PIN:101 CONTROLLER FLASH
SELECT VEHICLE OVERLAP (A=1, P=16)...5
SELECT COLOR (0=RED,1=YEL,2=GRN)...1
```

WHEN A "Y" IS ENTERED FOR "VEHICLE OVERLAP" THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS ENTER AFTER ENTERING DATA, THEN ESC.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS "VEHICLE OVERLAP" AS SHOWN BELOW:

```
PAGE:1 C1 PIN:101 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID, 1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

VEHICLE OVERLAP E (YELLOW) LOAD SWITCH AUX S3

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Electrical Detail-Final Design-Sheet 9 of 9

ELECTRICAL AND PROGRAMMING DETAILS FOR:

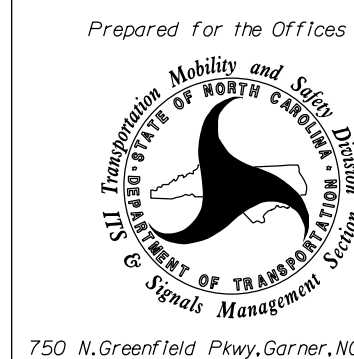
US 74 Bus. (Marion Street)
at
NC 150 (Cherryville Road) /
SR 2053 (Peach Street)

Division 12 Cleveland County Shelby

PLAN DATE: March 2022 REVIEWED BY: J.L. Lewis

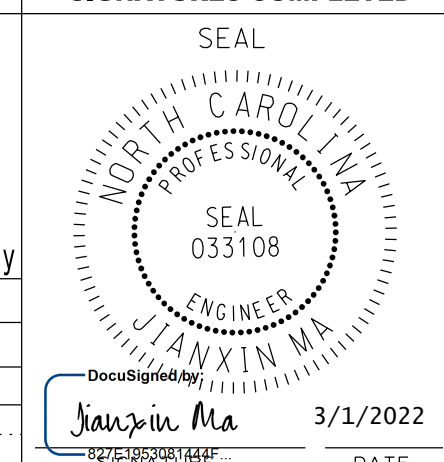
PREPARED BY: J. Ma REVIEWED BY: M.L. Stygles

REVISIONS INIT. DATE



VHB Engineering NC, P.C. (C-3705)
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DATE: 3/1/2022
SIGNATURE: J. Ma
DATE: DATE
SIG. INVENTORY NO. 12-0600